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ABSTRACT

Research identified leader skills and leader-group interactive processes that have potential influence on unit performance in tactical situations. An historical review of the leader research literature was conducted, and leader models from leader research along with theory from industrial, managerial, and academic settings were reviewed. The problem-solving approach was found most relevant for addressing the skills and demands placed on leaders. Both it and research on communications aided in delineation of leader skill categories. From historical engagement simulation (ES) data (battle narratives, audio tapes, and net control sheets collected at ES exercises), the literature search, and research staff ES combat experiences, a listing of leader skill categories and individual leader skills was developed. The twelve skill categories, subsumed under five broader headings, were (1) management skills--planning, execution and control, initiating structure, and interacting with subordinates and supervisors; (2) communications skills--transfer of information and pursuit and receipt of information; (3) problem-solving skills--identification and interpretation of cues, weighing alternatives, and choosing a course of action; (4) tactical skills--application; and (5) technical skills--equipment and basic. Appendixes include a leader skills matrix, leader observation checklist, and a subordinate questionnaire. (YLB)

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Technical Report 440

IDENTIFICATION OF COMBAT UNIT LEADER SKILLS AND LEADER-GROUP INTERACTION PROCESSES

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U.S. DEPARTMENT OF HEALTH,
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The purpose of the research effort was to identify analytically those leader skills and leader-group interactive processes having potential influence on unit performance in tactical situations. An historical review of the leader research literature was conducted, with special focus on leader skills and processes as they occur in tactical settings.

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20. Abstract (Continued)

Leader research and theory from industrial, managerial, or academic settings was useful for acquiring an understanding of the state-of-the-art. Of the leader models reviewed, the problem solving approach was the most relevant for addressing the skills and demands placed upon leaders in tactical settings. The research on communications was also considered quite relevant. Both of these areas of research aided in the delineation of the leader skill categories.

On the basis of historical ES data (battle narratives, audio tapes, and net control sheets collected at ES exercises), the literature research, and research staff ES/combat experience, a listing of leader skill categories and individual leader skills was developed. The skill categories were arrived at inductively by listening to audio tapes and examining battle narratives, listing the individual skills involved, and arriving at a general skill category under which the numerous individual skills could be subsumed. If there were a parallel skill category already existing in the research literature (e.g., initiating structure) that consisted of the same skills involved in ES, it was readily adopted. Many of the skill categories, however, did not have identical counterparts in the research literature. The skill categories, subsumed under five broad headings were: (a) management skills--planning, execution and control, initiating structure, and interacting with subordinates and superiors, (b) communication skills--transfer of information, and pursuit and receipt of information, (c) problem solving skills--identification and interpretation of cues, weighing alternatives, and choosing a course of action, (d) tactical skills--application, and (e) technical skills--equipment and basic.

FOREWORD

Research initiated by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in 1972 has led to the development of a family of tactical engagement simulation training techniques. This report presents a taxonomy of leader skills and leader-group processes developed from a review of leader research literature and an analysis of engagement simulation data and combat experience. The taxonomy constitutes a means of measuring observable leader performance during engagement simulation exercises which may be related to tactical unit performance. The research conducted was in response to the requirements of Army Project 2Q263744A795 as a part of a larger program of research in tactical training for TRADOC.

JOSEPH ZEIDNER
Technical Director

IDENTIFICATION OF COMBAT UNIT LEADER SKILLS AND LEADER-GROUP INTERACTION PROCESSES

BRIEF

Requirement:

To identify leader skills and leader-group interaction processes that may have potential influence on unit performance in tactical situations.

Procedure:

A review of leader research literature was conducted, and an analysis was made of recorded engagement simulation data from previous field exercises. A taxonomy of leader skills and group interactive process categories was synthesized, and an operational listing of individual leader skills was developed.

Findings:

Twelve skill categories, subsumed under five broader headings, were identified as follows: (a) management skills--planning, execution and control, initiating structure, and interacting with subordinates and superiors, (b) communication skills--transfer of information, and pursuit and receipt of information, (c) problem solving skills--identification and interpretation of cues, weighing alternatives, and choosing a course of action, (d) tactical skills--application, and (e) technical skills--equipment and basic.

Utilization of Findings:

The taxonomy developed for leader skills and leader-group interaction process may be utilized to observe and measure behavior during unit tactical performance. Analysis of leader behavior and unit performance in varying situations has the potential of identifying the important variables producing effective unit and leader performance. When the important variables are identified, a training model for employing both engagement simulation and battle simulation technologies may be developed for combat arms unit leaders.

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Introduction

For several years, the Army Research Institute, in conjunction with the research and development community, has been developing tactical engagement simulation (ES) systems for unit training in the combat arms. Engagement simulation is a tactical training technique employing devices to simulate with a high degree of psychological fidelity the casualty-producing effects of weapons found on the modern battlefield. Experience with ES indicates that leader behavior and leader-subordinate interaction processes play critical roles in unit performance. However, it has not yet been possible to identify and define explicitly those leader behaviors and group processes that lead to successful tactical performance. Therefore, the purpose of the present research is to determine what leader skills and leader-group interaction processes have a potential influence on unit performance in tactical situations.

The literature on leadership certainly does not suffer from a dearth of inquiry. If one were to accept the proposition that disparate approaches and conflicting results were a sign of intellectual vitality and well-being, then one should not be too alarmed by recent reviews that characterize the state-of-the art as not encouraging (Hunt and Larson, 1977). Not only do investigators disagree on how to interpret their findings meaningfully, but also there is an apparent lack of confidence in the methodologies employed and the ensuing data bases. Theoretical structures placed atop such a shaky foundation are precarious edifices indeed. However, in order to acquire an appreciation of the current status of research on leadership, one needs to start with the origins and subsequent developments of this interesting field. The first part of this section is therefore devoted to an historical review of significant research movements. The second part will examine some prominent theoretical models of more recent vintage. The third part will narrow its focus to a leader taxonomy--in particular, those leader skills and group interactive processes that are likely to have a potential influence on unit performance in tactical situations. Finally, measurement procedures will be discussed.

Historical Review

Trait and Situational Approaches

Notions on leadership no doubt could be traced back to the writings of the ancients; however, it is the systematic study of leadership that concerns us, and as a result our historical sketch spans only a century. Galton's (1879) influential study of the hereditary background of distinguished men in the arts and sciences helped to set the groundwork for what came to be known as the "great man" theory of leadership. Likewise, Carlyle's (1910) landmark essay on leadership embraced the concept of the leader as a person endowed with unique qualities that set him or her apart from the masses. Those who followed in Carlyle's footsteps set about the task of identifying those qualities or traits with which "great men" were blessed. The Zeitgeist was appropriate for the trait approach to leadership to take hold among psychologically-oriented investigators of the 1930s and 1940s. Psychologists have had a long-standing interest in individual differences, and when they found themselves equipped with a new tool--the personality test--it seemed eminently appropriate that they should actively pursue personality traits that distinguish leaders from non-leaders. The writings of Bingham (1927), Tead (1929), Kilbourne (1935), and Dowd (1936) provide good examples of the trait approach to leadership. Despite the early enthusiasm, studies of leadership traits never produced the yield that the original investigators had envisioned. Successive reviews (Stogdill, 1948; Mann, 1959; Hollander and Julian, 1969) report very little in the way of reliable or useable results.

The problems that are encountered with a pure trait approach are many. To maintain that there is a unique set of traits that leaders share in common would force us to conclude that General George Patton, Florence Nightingale, and Mahatma Gandhi had highly similar leadership traits. Any position that emphasizes the centrality of traits would also predict that leaders in one situation would be leaders in other situations as well. Mahatma Gandhi thus would be just as effective a leader of the 2nd Armor Division as was George Patton. Conversely, George Patton could just as effectively lead the teeming masses of India as did Mahatma Gandhi. While this may be an intriguing (if inane) suggestion, it is easy to see how the early attempts to uncover essential leader characteristics met with repeated failure. Perhaps the most serious criticism of the trait approach is that it presents a static, one-way view of leadership--leaders are portrayed as detached, isolated entities, immune from the consequences of their actions. Such factors as the nature of the task faced by the group and the overall context within which the group operates are ignored by the trait theory. In the face of this unprofitable state of affairs, psychologists turned their attention to a different approach.

This newer movement, which started to take hold in the 1950s (Stogdill, 1948; Gouldner, 1950), focused on situational rather than personality determinants. Research started to show that the person most likely to become a leader in a given situation was not the charismatic "great man." Instead the leader was differentiated from non-leaders by the given task of the group and its corresponding situational demands. The nature of the group task favored those individuals who were especially well-equipped and competent to guide the group toward attainment of its particular goals. Furthermore, and perhaps most important, the situational approach anchored leadership events to the life space in which they occur. Hollander and Julian (1969) put it this way "...it was to recognize that the qualities of the leader were variously elicited, solved, and reacted to as a function of differential group settings and their demands" (p. 389). Or as Cartwright and Zander (1960) state "...while certain minimal abilities are required of all leaders, these are widely distributed among non-leaders as well. Furthermore, the traits of the leader which are necessary and effective in one group or situation may be quite different from those of another leader in a different setting" (p. 492). After declaring "there are no absolute leaders, since successful leadership must always take into account the specific requirements imposed by the nature of the group" (1949a, p. 225), Hemphill went on to publish in the same year his well-known Situational Factors in Leadership. This work investigated systematically the characteristics of group situations as they were related to the behavior of leaders. At this point, the group situation became the primary focus of study.

Was there any empirical justification for this radical shift? Indeed there was. Carter and Nixon (1949) conducted a study of leaderless high school boys as they performed on three different kinds of tasks: intellectual, mechanical, and clerical. Boys who were leaders on the intellectual tasks also tended to be leaders on the clerical tasks; however, for the mechanical tasks, new leaders tended to emerge. Thus, to some extent at least, requirements for leadership were situationally dependent. In related experiments, Carter, Haythorn, Shriver, and Lanzetta (1951), and Gibb (1947), very similar results were found--that is, the behavior of leaders differed from one situation to another, depending upon requirements of the group task. In a study of 40 naval officers--20 of whom were transferred to new positions, and also the 20 whom were to replace--Stogdill, Shartle, Scott, Coons, and Jaynes (1956) found that after several months in their new positions, transferred officers resembled officers whom they replaced in patterns of work performance but not in patterns of interpersonal behavior. In other words, job requirements were such that they instilled highly similar patterns of work performance in whoever held the position. Job requirements did not, however, mold interpersonal behavior. In yet another study, Megargee, Bogart, and Anderson (1966) had subjects who differed on dominance test scores (high and low) perform two different tasks. Instructions on one of the tasks emphasized the task itself; in the other condition, leadership was emphasized in the instructions. When leadership was emphasized, the highly dominant subjects emerged as leaders. But when the task was emphasized, there was no significant difference between the two groups in terms of leadership emergence.

Results from the above studies tend to support the conclusion that the nature of the task that confronts group members plays an important role in determining who emerges as a leader. It should be pointed out that studies can be cited that are contrary to those reviewed above. Consistency of performance in different groups with varying tasks has been found in the same leader as well (Blake, Mouton, and Fruchter, 1954; Borg and Tupes, 1958; and Borgatta, 1954).

If the situational view is pursued to the ultimate extreme, it suggests that virtually any member of the group can become a leader as long as favorable conditions prevail. There is some evidence, although not unequivocal, for this point of view (Zdep and Oakes, 1967). In the Zdep and Oakes (1967) study, individuals who were initially ranked low in leadership by other group members following group discussion were then either reinforced for taking a more active role or punished for remaining passive. Under these conditions, subjects did indeed play a more active role. Even more interesting, they were ranked significantly higher in leadership by other group members following this second session than they had been after the initial session.

However, in bold form, the situational view is subject to criticism, too. It also presents a "one-way" view of leadership whereby the situation appears as the controlling factor and seemingly "selects" a leader. The more current viewpoint of the approaches discussed so far is that they present a far too simplistic view of reality (Hollander and Julian, 1969; Stogdill, 1974). Rather than being separate entities, the leader and situation merely represent different components in a continuing multidirectional process of social influence and exchange. As a reciprocal phenomenon, leaders not only influence the situation and group members, but are influenced, in turn, by them. This interactive-transactional approach points to a more complicated, and perhaps richer, view of leadership. It casts new light on the leadership process and allows fresh possibilities to be explored.

It may be useful to review some of these more recent considerations. A distinction, which was not made in the earlier literature, can be made between leadership and the leader. Leadership is a process of social influence and exchange among two or more interdependent persons who are grouped together for the attainment of mutual goals. The leader, as a person, usually occupies a central role in this process. In the last two decades, research interest has shifted from the leader as a unidirectional force to the study of the process of leadership. It is also important to realize that the leadership process or transaction takes place over time and is continuously changing. Most of the research studies, however, are one-shot affairs. There are very few longitudinal studies of leadership in the literature. It takes time for group goals, leader abilities, and situational factors to become synchronized in a working relationship. Many of the early studies--and much of the recent literature--were conducted on groups formed solely for the purpose of the experiment. It is certainly reasonable to entertain the belief that such groups will differ in significant ways from well-established groups in formal organizations (Jacobs, 1971). Another distinction that impacts on the internal processes of the group is between emergent and imposed leadership. Emergent leadership usually arises from a loosely structured group and is contingent upon the consent of other group members. Bales (1950) finds that a "task leader" and a "social-emotional leader" often emerge from such groups. By contrast, an imposed leader is appointed by external authority in a formally structured situation. Imposed leaders may or may not be perceived favorably for attributes that would make them acceptable to group members as emergent leaders as well. Surely, the source of the leader's authority as it is perceived and reacted to by the group is an important component in the leadership process. Other external restraints, often overlooked, are instructional or organizational in nature. Appointed leaders are usually assigned to groups with specific functions and related in well-prescribed ways to other areas of operation within the organization. The actions of such leaders can be highly determined by the surrounding context. Under these conditions, leadership becomes a means rather than an end in itself (Hollander, 1967). As Bavelas (1960) suggests "organizational leaders" may well be those who perform certain functions rather than having certain attributes of personality.

The Ohio State Leadership Studies

The Ohio State Leadership Studies represent another clearly identifiable movement in the leadership literature. Rather than study personality traits, the new effort concentrated on the behaviors that individuals displayed in leadership positions. Hemphill (1949a) and his associates constructed a list of approximately 1,800 items describing different aspects of leader behavior. The items were then sorted by staff members into nine categories or subscales; 150 items were found on which sorters agreed about the subscale to which an item should be assigned. It was from these items that the first Leader Behavior Description Questionnaire developed (Hemphill, 1950; Hemphill and Coons, 1957). Several factor analytic studies performed by Halpin and Winer (1957) of item intercorrelations produced two factors, identified by Hemphill as initiating structure and consideration. Two different patterns of behavior, rather than the nine originally suggested, actually composed the scale. For more than 25 years, the concepts of initiating structure and consideration have been an integral part of the language of leadership and its measurement.

According to Fleishman (1973), initiating structure involves acts that imply that the leader "organizes and defines the relationships in the group, tends to establish well-defined patterns of communication and ways of getting the job done (e.g., he assigns people to particular tasks, he emphasizes deadlines, etc.)" (pp.7-8).

The Leader Behavior Description Questionnaire was first used with Air Force personnel. Halpin (1954) found that supervisors tended to evaluate positively those air crew commanders described high on initiating structure and evaluated negatively those described high on consideration. Crew member satisfaction, conversely, was positively related to consideration and negatively related to structure during training. For the same crews in combat, however, member satisfaction was positively related to both consideration and structure. In an educational setting, when teachers and principals are described as high in consideration and structure, their pupils tend to make higher scores on achievement tests (Brown, 1967; Greenfield, 1968; Dawson, 1970). An industrial study by Fleishman and Harris (1962) found that grievances and turnover tend to decrease with increased supervisory consideration, but increase with increased supervisory structure.

The underlying intent of the above studies was to identify specific leader behaviors that would be related to effective group performance as well as to member satisfaction so that leaders might be trained to engage in these behaviors. A review of the literature by Korman (1966) indicates that these lofty expectations have not been fully realized. While there is general consensus that consideration and initiating structure describe important leader behaviors, so far these behaviors have not correlated consistently with group performance.

The Study of Military Leadership

It was shortly after World War II that the study of military leadership started in earnest. In accord with the research temper of the time, Otis (1950) published a paper entitled "The Psychological Requirements Analysis of Company Grade Officers." In addition to surveying the available literature, extensive combat interviews at the division and small unit level were taken. Citations for medals among officers were also analyzed. From all this information, clusters of traits characteristic of good officers were identified. A distinction that continues to be made was made between garrison and combat leadership. It was realized that good garrison and combat leaders might not display the same traits. As it turned out, identification of personality traits proved far too general to be useful for selecting leaders. The results of the Otis study were noteworthy not simply because they made a distinction between garrison and combat officers but also because they pointed out that different things were expected of officers in different situations.

Several research studies were conducted to develop performance measures of small unit (squad) effectiveness and to identify reliable predictors of effective performance that could be used for selection and placement purposes. All of these efforts were based on the premise that "combat success in modern warfare is coming to depend, to an ever-increasing degree, upon the effective operation of small groups of men, working in teams" (Havron, Fay and Goodacre, 1951, p. i). Training small units in their group operations, and measuring the effectiveness of such training, was seen to be important, especially in view of the commitment of American troops in Korea. Because of this involvement, the emphasis of Havron's early study was on the development of ways of assessing the operational readiness of small units. The technique used to measure effectiveness was a set of criterion field problems. These field problems were developed to cover all the critical combat duties of a unit. The problems were then administered under standardized conditions; effectiveness was calculated as the sum of scores derived from squad leaders, squad members, and total squad performance. Similar methods were used to develop and evaluate field problems in later studies (Havron, Lybrand, and Cohen, 1954a, b, c, d).

The drawback of Havron's method seems to be that, although team interactions are recognized to be the major element of squad effectiveness, the actions identified for inclusion in the field problem are those that primarily depend on individual skills. Group behavior is difficult to measure unless it is something easily observed like "squad moves out on time" or "squad forms skirmish line." The critical skills of communication among members and decision making by the leader based on available information were not considered. Nor did the testing situation of these studies allow these skills to be exercised to any significant degree. Performance was evaluated by comparing it to the standardized individual responses described as appropriate behavior. Such rigid situations do not allow for the diversity of actions and conditions that would occur in combat, and they do not measure what the research sets out to measure.

In combat, the most effective course of action will depend upon the specific situation (conditions)--primarily enemy behavior, but including terrain and weather and other variables as well. The tactical moves (behavior) made by each side will be in response to early moves of the opponent. This constantly changes the stimuli and makes "standard" situations and solutions artificial. The advantage of artificial situations is ease of performance measurement. Each step can be evaluated in isolation since it will not be affected by previous actions or affect subsequent actions. However, this step-by-step approach does not reflect the true nature of a combat situation and therefore will not produce a valid measurement of combat readiness regardless of how steps are weighted in a predictive formula.

The second goal of Havron's studies was to develop reliable predictors of unit effectiveness. This was done by identifying personal/sociological variables from high and low scoring groups and correlating them to the scores on the field problem. Variables were considered for the leader alone, for each of the team members, and for the team as a group. The variables included: individual characteristics, measures of interpersonal relationships, and measures of group-derived motivations toward Army-defined goals. Analysis of these variables did not produce a significant degree of correlation except for a low correlation between individual characteristics of squad leaders and criterion scores.

In the 1950s a project called Offtrain undertook the development of a leadership course for junior officers from which a series of research reports resulted (e.g., Lange, Rittenhouse, and Atkinson, 1956; Lange, Campbell, Katter, and Shanley, 1958; Lange and Jacobs, 1960; Jacobs, 1962; and Jacobs, 1963). Lange, Rittenhouse, and Atkinson (1956) used a combined film-discussion technique to portray realistic leadership problems and to allow participants to engage in the problem solving process. Students who received the film-discussion technique showed greater improvement in the quality of their solutions than did students who received regular training. It was concluded that such a film-discussion technique would improve leadership training.

Another study sought to describe the actual day-to-day, on-the-job leadership behaviors that distinguish effective and ineffective infantry platoon leaders (Lange, Campbell, Katter, and Shanley, 1958). In brief, it was found that effective leaders clearly and consistently emphasized performance as a basis for reward and punishment, clearly communicated desired standards, and provided precise information for needed improvements. It is apparent that these behaviors are what is meant by the term "initiating structure." In the sequel study, Lange and Jacobs (1960) developed the Leader Behaviors Questionnaire (LAQ)--a paper-and-pencil measure of the leader behaviors encountered in the earlier study. The LAQ was conceived as an economical device to be used after training to assess the degree to which the actual on-the-job behaviors of platoon leaders had been favorably modified. There was satisfactory agreement among platoon members with regard to the behavior descriptions they gave their platoon leaders. It was concluded that the LAQ measured fairly well those leader behaviors it was designed to measure. Jacobs (1963) next developed a leadership course based (1) on the research findings that identified effective and ineffective leader actions, and (2) on previously demonstrated effective training methods. The course focused on the effect of the leader's actions on both the morale of his men and the unit's ability to perform assigned tasks. Students' reactions to the course were reported as favorable.

Research on leadership at the NCO level is of equal interest and importance. Clark (1955) and his colleagues interviewed the members of 81 rifle squads on the front line during the Korean conflict to determine some of the factors associated with effective squads. The men were asked with whom they would like to share a bunker, go on leave, or fight. Various sociometric indices were obtained for acceptance patterns and friendships among squad and platoon members. These indices were then related to effectiveness as judged by superiors' ratings and successful combat missions. Five non-combat functions, some related to the "emotional climate" of the squad, were found characteristic of effective squads. According to Clark (1955) they were:

> Managing. Managing the squad involves supervising the distribution and maintenance of supplies and equipment, serving as a channel of communications, and assuming the responsibility for seeing that the squad carries out its assigned mission.
>
> Defining. Defining rules and procedures for appropriate behavior is largely a verbal activity. Individuals performing this function initiated discussions among squad members, talking about what the men wanted and needed. "Definers" promoted understanding of what was expected of each man in the squad.
>
> Modeling. Performing as a model is a verbal process in which, through discussions, squad members come to agree on what activities constituted appropriate behavior. An individual who performs this function might be described by squad mates as "the best all-around combat man" or "whatever he does, he does the best he can."
>
> Teaching. Teaching squad mates is a function that requires two attributes: to teach one has to be skilled in some operation and be able to explain the process or operation in a way understandable to others.
>
> Sustaining. Those individuals who sustained squad mates with emotional support were described as: "He's easy to talk to;" "He listens to our gripes and helps to set things straight;" and "He just seems to understand things." The sustaining function was seen as having therapeutic value--interpersonal problems come out in the open and are settled. Squad members develop more confidence in each other and seem to be a closer, more harmonious group.

Table 1, adapted from Clark (1955), shows the number of squads in which the leadership function was performed, and who in the squad actually performed the function.

TABLE 1

Performance Of Five Leadership Functions
In 69 Squads (Adapted From Clark, 1955)

	Number Of Squads In Which Function		Function Performed By		
Function	was performed	was not performed	Squad Leader	Assistant Squad Leader	Other Squad Member
Managing	67	2	64	37	1
Defining	52	17	35	19	14
Modeling	26	43	13	8	8
Teaching	26	43	14	6	9
Sustaining	24	45	11	7	11

It is clear that the managerial functions of managing the squad and defining rules and procedures for acceptable behavior were the most frequently performed activities. Performing as a model, teaching, and sustaining with emotional support--functions that encompass interpersonal skills--were certainly in evidence (in approximately 36% of the squads) but considerably less so than the managerial functions. It is also interesting to note that it was primarily the squad leader or assistant squad leader who performed the managerial functions while the interpersonal functions of modeling, teaching, and sustaining were as likely to come from other squad members. Since not all the functions were performed by the leader, this suggests any training program must be focused on the platoon members as well.

Sociologists and social psychologists for a long time have realized that groups display qualities that are more than simply a sum of their individual parts. It is therefore not surprising that military social and behavioral scientists would be interested in investigating the conditions that distinguish successful squads from unsuccessful ones. Watson (1978) reports on a series of studies performed by the Army's Personnel Research Branch in which field exercises that included reconnaissance, attack, and defense elements were developed to pinpoint differences between good and poor squads. These differences were then correlated with simple and economical psychological tests. Accordingly, squads with men who were sociable and conventionally "masculine" performed effectively, as did squads who were psychologically homogeneous (men who had similar levels of aspiration). Squad members were also given a questionnaire that measured the extent to which they wanted to share non-military activities, garrison activities, and combat duties. Squads that had quite a few isolates--men who were not chosen by anyone for shared activities--performed the poorest on the field exercises. The fewer favorites that a leader had (as reflected in how he distributed assignments among his men) the better the squad. Garrison behavior also tended to be related to exercise performance. Men who maintained discipline when the leader was absent, who kept their weapons and quarters clean, and who reported promptly for duty, also did above average in the field. A general motivational factor is perhaps the most plausible explanation for this relationship.

Coordination, or what others call team work, has obvious relevance for small units. George (1966) developed a method that taught men in a rifle squad how to coordinate their fire to improve their kill ratio. Four- or five-man squads were instructed to fire at fleeting pop-up targets. Once hit, the targets would not reappear until all the targets had been hit--that is, the man who just hit his own target could not score any more personal hits and had to turn his attention to targets of his fellow squad members. Wide variation existed among the men in their readiness to coordinate their fire. Some fired on targets when it was not required and others fired upon dead targets. To enhance coordination, two changes were instituted; the men were instructed to fire only at their own and adjacent targets, and the ammunition was redistributed so that the "wild shooters" were given less ammunition than the rest of the squad. The group trained in this fashion out-performed the conventionally trained group with respect to kill ratio. An important by-product of the coordination training was increased self-esteem within the squad. George's research is interesting in that it suggests what has long been expected: coordination among the members of a unit will improve some measure of overall performance (albeit in a fairly well structured setting). It would be too much to assume, however, that the same finding would unequivocally generalize to a more dynamic, free-play, simulation setting until such a setting can be empirically studied.

Effective communication, as will be seen, is an essential group process upon which successful functioning of the squad depends. It is understandable that the Army is interested in manipulating different aspects of communication in order to observe their effects on squad performance. Dees (1969) developed a simulated tactical problem based upon the type of tasks that might be performed by infantry squads in decentralized combat operations. The combat simulations included: 1) a daylight search and destroy operation, 2) a night raid, and 3) a night defense. Special events that required a communicative reaction were introduced at each phase. Radio communication was manipulated so that no one had a radio, or just the platoon and squad leaders had radios, or to a situation where everyone had a radio. The time taken to spot a boobytrap, to report it back to the squad leader, and for the squad leader to issue the appropriate order are examples of the dependent measures used. Observers also rated the squads on maintaining noise discipline, maintaining contact with squad elements, following designated procedures, and keeping leaders informed of relevant developments. Across a wide variety of events--evaluation of casualties, defending a landing zone, organizing a successful assault--the distribution of radios had a significant effect on the time taken to perform these operations. Too many two-way radios had a deleterious effect on the effectiveness of the unit. The most effective form of two-way radio distribution was to assign radios only to the platoon and squad leaders. Chaos and needless chatter resulted when everyone had a radio.

Apart from the trait and situational approaches, leadership research up until the late 1950s appears to have been thwarted by a lack of direction. To be sure, there were pockets of activity such as the Ohio State studies and the leadership problems that were of interest to military investigators. Overall, however, disparate approaches seemed to reign supreme. Fortunately, during the last 20 years, a number of models and theories have appeared on the leadership scene and have provided some needed guidance to those seeking empirical relationships. Many of the models are quite recent and have not been adequately tested. Others have generated considerable research and, while their status among theoretically-oriented investigators is mixed, there appears to be a greater sharing and cross-fertilization of ideas. It is our intention to review briefly these theories and models that have achieved some prominence. Where it is appropriate to pinpoint flaws and inadequacies, we will do so.

Some Current Models Of Leadership

Fiedler's Contingency Model

First to be considered is Fiedler's contingency model of leadership effectiveness (Fiedler, 1967). Central to Fiedler's work is his use of a Least Preferred Co-worker (LPC) score. A premise of this theoretical model is that leaders vary in the degree of esteem they feel for the person in the group with whom they least like to work. Thus, a person with a high LPC score describes his least preferred co-worker in a relatively favorable light. Such a person tends to be tolerant, human relations-oriented, and considerate of subordinates. A person with a low LPC score, on the other hand, describes his least preferred co-worker in an unfavorable light. This person tends to be task-oriented and is less concerned with human relations. The LPC instrument consists of a series of 16 or 28 eight-point bipolar adjective pairs modeled after the semantic differential (Osgood, Suci, and Tannenbaum, 1957). The contingency aspects of Fiedler's model propose that the important factor in determining whether high or low LPC leaders would be more effective in leading a group would be the degree to which the situation favored the leader. The degree of favorability, according to the model, is a function of three factors: 1) leader's relationships with group members, 2) the degree of task structure facing the group, and 3) leader's position of power. A highly favorable situation is one in which the leader enjoys good relations with other group members, the task is highly structured, and the leader's power in the group is strong. The converse would hold true for an unfavorable situation. Fiedler next predicted that low LPC leaders (task-oriented) would be very effective in situations highly favorable to the leader since the group situation is already geared for such a leader. In situations highly unfavorable to leadership, a low LPC leader would also be effective since under adverse conditions a take-control type of leader is needed for effective functioning. Under conditions that are only moderately favorable to the leader, however, a high LPC style of leadership (nondirective, human relations-oriented) is considered best in order to improve group cooperation and morale.

The situational base from which Fiedler constructed his model is quite broad and ranges from, among other things, anti-aircraft artillery crews on training missions (Hutchins and Fiedler, 1960) to church groups on discussion problems (Fiedler, Bass, and Fiedler, 1967). In his best known work, Fiedler (1967) found interactions between LPC score and situation favorability that conformed to the model. His research, however, has not escaped criticism. A number of writers have pointed out that the post hoc development of the model isolates it from the self-correcting influences of disconfirming empirical results (Graen, Alvares, Orris, and Martella, 1970; McMahon, 1972; Schriesheim and Kerr, 1977). The studies cited in support of the model are the same ones used to construct it! Since the model has been revised and changed to fit the results, these same studies cannot be used in support of the model. In addition to methodological problems, data offered in support of the model often fail to meet standard prescribed levels of significance (Graen, Orris, and Alvares, 1971). Another problem centers on the construct validity of the LPC score. Schriesheim and Kerr (1977) note that it is "a measure in search of a meaning"--or as Fiedler and Chemers (1974) state, "Understanding LPC has been a maddening and frustrating odyessy. For nearly 20 years, we have been attempting to correlate it with every conceivable personality trait and every conceivable behavior observation score. By and large these analyses have been uniformly fruitless" (p. 74).

It is apparent that the contingency model is not without its shortcomings. It is, however, the best known of all the situational theories and has played an important role in generating systematic research and in stimulating others to develop alternative theories incorporating different variables.

House's Path-Goal Theory

The original version of House's (1973) path-goal theory attempted to define situationally the causal relationships linking the leader's initiating of structure and consideration to subordinates' performance and work attitudes. In this model, a leader who initiates structure assigns particular tasks, specifies procedures to be followed, clarifies his expectations of subordinates, and schedules the workload. Consideration is used to describe the degree to which the leader creates a supportive environment, characterized by warmth, helpfulness, and a concern for the personal welfare of subordinates. Leaders who initiate structure for subordinates have generally been rated higher by superiors and also have higher producing work groups when compared to leaders' low on initiating structure (Filley and House, 1969). It is reported that leaders who are considerate of subordinates have more satisfied employees; however, studies that have attempted to pinpoint the relationship between initiating structure and subordinate satisfaction have produced conflicting results. Initiating structure among unskilled and semi-skilled employees appears to result in dissatisfaction, grievances, and turnover (Fleishman and Harris, 1962), while for employees situated in large groups initiating structure is more palatable (Hemphill, 1950; Mass, 1950; Vroom and Mann, 1960). In this way, House (1973) thus tried to reconcile these conflicting findings under a set of general propositions from which they could be logically deduced. The theory posits that the leader's effectiveness in performing either of these motivational functions is dependent upon the structure of the task. In an unstructured situation, the effective leader will be one who clarifies the paths and subordinate work roles for task accomplishment. By removing the roadblocks to successful work performance, it is suggested that greater subordinate satisfaction and intrinsic reward will accrue. On the other hand, if a leader tries to initiate structure on tasks that are already highly structured, such attempts may be perceived by subordinates as excessively directive and restrictive. Under these circumstances, it would behoove the leader to motivate his or her subordinates with considerate direction.

Sheridan, Downey, and Slocum (1975) tested the notion that there is a causal linkage between leader behavior and subordinates' perceived expectancies, which, in turn, is supposed to affect job performance and satisfaction. They examined leader behavior along four dimensions--role clarification, supportive, participative, and autocratic. House and Mitchell (1974) maintained that each of these leadership styles would differentially lead to effective task performance and employee satisfaction under different task structures. In brief, role clarification was considered optimal for subordinates engaged in unstructured tasks; supportive leader behavior was best matched with highly structured work; participative leaders were considered most effective with subordinates engaged in ambiguous and poorly defined tasks; autocratic leadership was expected to have an adverse effect on subordinate satisfaction and performance in both structured and unstructured task situations. The results of the Sheridan, et al. (1975) study did not provide support for the above causal relations. Leader behavior was found to be related to subordinate satisfaction and motivation, but not to job performance. The relationships that were found were of a reciprocal nature and thus causal linkage to leadership cannot be inferred. Task structure did not appreciably moderate these relationships. These results suggest that leadership behavior per se has only a weak impact on the criterion variables tested so far. Obviously, additional variables need to be considered if a sizable portion of the variance is to be accounted for. House and Dessler (1974) suspect that the subordinate's need for achievement and affiliation, the norms of the primary work group, the formal authority system of the organization, and the subordinate's perceived ability relative to the task demands, may all be implicated in the relationship between leadership style and subordinates' satisfaction and performance. Part of the difficulty with path-goal theory is that it may not be sufficiently operational in providing clear, testable propositions. As Osborn (1974) has pointed out, "the exact dimensions of the subordinates' environment are not clearly defined" (p. 57). Surely the environment varies in ways other than simply structured and unstructured.

Graen's Vertical Dyad Linkages

A somewhat different approach to the study of leadership has been attempted by Graen and his associates (Dansereau, Graen, and Haga, 1975; Graen and Cashman, 1975). Their primary focus is not on outcomes but instead on how influence processes develop and change over time. According to Graen (1975) formal organizations set the stage for role-making processes whereby dyadic (two-person) social structures emerge. These dyadic structures allow the interdependent individuals to establish how they will interact and to agree on relationship norms. When role-making processes are used to describe the development of both interlocked behavior and relationship norms between leaders and each of their members, Graen and Cashman (1975) speak of vertical dyad linkages (VDL). An important developmental aspect of the model is the occurrence of signs (early warning detectors) of the emerging dyadic structures. These signs are used to predict over time the nature of the developing social structure. The sign used in Graen's role-making model is called "negotiating latitude between a member and his leader." Used as an independent variable, this measure tries to assess the degree to which a leader will provide individual assistance for a group member. The basic idea is that a dyadic relationship that is characterized by individualized assistance is more likely to result in negotiated exchanges between member and leader than one not characterized by this treatment variable (Graen and Cashman, 1975). In-group or out-group exchanges are likely to follow depending upon a group member's perception of his leader as being either open or closed to requests for individualized assistance. It is not assumed that a leader will be equally open to all requests for individual assistance nor is it assumed that a member's reactions to all leaders will be the same. In fact, Graen and Cashman see the assumption of heterogeneous behaviors from both the supervisor and unit member as a unique and valuable feature of the model that sets it apart from others. Not everyone agrees. Cummings (1975) argues that "heterogeneity is equally as unrealistic as homogeneity while describing leader behaviors and member reactions." Cummings cites equality considerations employed by a leader as a safeguard against charges of preferential subordinate treatment and the time and energy costs associated with acting heterogeneously as two good reasons for not behaving differently to each subordinate. In the same vein, as a result of similar past work-related reinforcement histories and the generalized reinforcing properties of leaders, followers do not behave differently toward all leaders past and present. Cummings suggests that it is just as likely the leader may become a discriminative stimulus for a general or homogeneous class of behavior. One only needs to think of the "yes men" that surround leaders and the "groupthink" that stifles creative problem-solving efforts to be convinced of the plausibility of homogeneity as well. Cummings (1975) is also critical of the excessive constructural baggage, fuzzy specification of dependent variables, and inconsistent operational definitions of key terms in the VDL model. In fairness to Graen and Cashman, it is best to remember that their model does represent a new approach and, while this is no excuse for their lack of precision, it will be up to subsequent research to demonstrate the fruitfulness of their efforts.

A Decision Making Model

Vroom and Yetton (1973) have developed a decision making model of leadership that centers around the degree of participation of subordinates in the decision making process. Behavioral and social scientists have generally argued for greater participation by subordinates at the decision making level, however, the research evidence is not unequivocal on participative management. Studies that report that increases in productivity can be brought about by subordinate participation (Coch and French, 1948; Marrow, Bowers, and Seashore, 1967) are offset by other studies showing no significant difference between workers who did and those who did not participate in decision making (French, Israel, and As, 1960; Fleishman, 1965). As is the case in many areas where research results are conflicting, one suspects interactions that may obfuscate any order one hopes to find in the data. The consequences of subordinate participation in decision making most likely vary from one situation to the next. In their normative model, Vroom and Yetton (1973) attempt to pinpoint the kinds of situations in which various degrees of participation in decision making would seem indicated. One of the basic assumptions that Vroom and Yetton make is that leadership methods on decision processes will differ for individuals and groups. For purposes of exposition, we shall list in Table 2 the leader's decision processes that pertain to groups.

TABLE 2

Decision Methods for Group Problems
(Adapted from Vroom and Yetton, 1973)

AI. You solve the problem or make the decision yourself, using information available to you at the time.

AII. You obtain the necessary information from your subordinates, then decide the solution to the problem yourself. You may or may not tell your subordinates that the problem is in getting the information from them. The role played by your subordinates in making the decision is clearly one of providing the necessary information to you, rather than generating or evaluating alternative solutions.

CI. You share the problem with the relevant subordinates individually, getting their ideas and suggestions without bringing them together as a group. Then you make the decision, which may or may not reflect your subordinates' influence.

CII. You share the problem with your subordinates as a group, obtaining their collective ideas and suggestions. Then you make the decision, which may or may not reflect your subordinates' influence.

GII. You share the problem with your subordinates as a group. Together you generate and evaluate alternatives and attempt to reach agreement (consensus) on a solution. Your role is much like that of a chairman. You do not try to influence the group to adopt "your" solution.

In their consideration of the empirical evidence that can be brought to bear on the normative model, Vroom and Yetton differentiate three classes of outcomes that influence the ultimate effectiveness of decisions. These are: (1) the quality or rationality (degree of objectivity) of the decision, (2) the acceptance of the decision by subordinates and their commitment to execute it effectively, and (3) the amount of time required to make the decision. The evidence concerning the effects of participation on these outcomes has been summarized by Vroom (1970):

> "The results suggest that allocating problem-solving and decision-making tasks to entire groups as compared with the leader or manager in charge of the groups requires a greater investment of man hours but provides higher acceptance of decisions and a higher probability that the decisions will be executed efficiently. Differences between these two methods in quality of decisions and in elapsed time are inconclusive and probably highly variable.... It would be naive to think that group decision making is always more 'effective' than autocratic decision making, or vice versa; the relative effectiveness of these two extreme methods depends both on differences in amount of these outcomes resulting from these methods, neither of which is invariant from one situation to another" (pp. 239-240).

The next step for Vroom and Yetton was to identify the properties of the situation or problem attributes that serve as basic elements of the model. Listed below are seven attributes of problems expressed in the form of questions to be used by a leader in diagnosing a particular problem before choosing his leadership method (Vroom, 1976).

Question A. Is there a quality requirement such that one solution is likely to be more rational than another?

Question B. Do I have sufficient information to make a high quality decision.?

Question C. Is the problem structured?

Question D. Is acceptance of decision by subordinates critical to effective implementation?

Question E. If you were to make the decision by yourself, is it reasonably certain that it would be accepted by your subordinates?

Question F. Do subordinates share the organizational goals to be obtained in solving this problem?

Question G. Is conflict among subordinates likely in preferred solutions?

The above problem attributes are obviously continuous in nature; however, they are stated in "yes-no" dichotomous form to reduce the complexity of judgment faced by leaders. According to Vroom, managers can diagnose a situation quickly and accurately by responding to these questions. The judgments made on each of the attributes are used to define a set of plausible alternatives. Rules are then applied that eliminate decision processes from the plausible set under certain specifiable conditions. The rules serve to protect the quality and the acceptance of the decision. They can be stated as either verbal statements or in the more formal notation of set theory. Altogether, Vroom and Yetton (1973) posit seven rules. They are:

1) *The informative rule.* $(A \cap \overline{B} \Rightarrow \overline{AI})$* When the quality of the decision is important and the leader does not possess enough information or expertise, AI is eliminated from the plausible set.

2) *The trust rule.* $(A \cap \overline{G} \Rightarrow \overline{GII})$ If the quality of the decision is important and if the subordinates cannot be trusted to direct solutions towards organizational goals, GII is eliminated from the plausible set.

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*For the reader not familiar with set theory, A signifies that the answer to question A for a particular problem is yes; $\overline{A}$ signifies that the answer to the question is no; $\cap$ indicates an intersection; $\Rightarrow$ means "implies"; and $\overline{AI}$ signifies not AI. Thus $A \cap \overline{B} \Rightarrow \overline{AI}$ tells us when the answers to A and B are *yes* and *no* respectively, decision process AI is eliminated from the plausible set.

3) The unstructured problem rule. ($A \cap \bar{B} \cap \bar{D} \Rightarrow \overline{AI}, \overline{AII}, \overline{CI}$) When the quality of the decision is important, if the leader lacks the necessary information and if the leader does not know exactly what information is needed, who possesses it, or how to collect it, methods that involve interaction among knowledgeable subordinates are likely to be efficient and insure quality. Under these conditions AI, AII, and CI are eliminated from the feasible set.

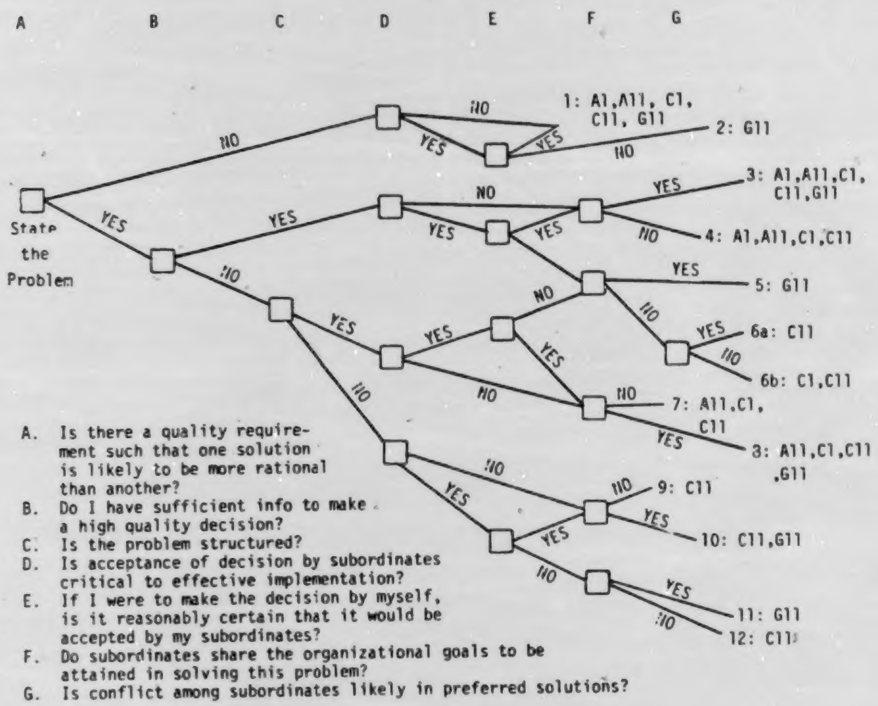
4) The acceptance rule. ($E \cap \bar{F} \Rightarrow \overline{AI}, \overline{AII}$) When the acceptance of the decision by subordinates is critical to effective implementation, and if it is not likely that an autocratic decision made by the leader would receive that acceptance, AI and AII are eliminated from the plausible set.

5) The conflict rule. ($E \cap \bar{F} \cap H \Rightarrow \overline{AI}, \overline{AII}, \overline{CI}$) If the acceptance of the decision is critical, an autocratic decision not likely to be accepted, and subordinates are likely to be in conflict over the appropriate solution, AI, AII, and CI are eliminated from the feasible set.

6) The fairness rule. ($\bar{A} \cap E \cap \bar{F} \Rightarrow \overline{AI}, \overline{AII}, \overline{CI}, \overline{CII}$) If the quality of the decision is not important, and acceptance is critical but not likely to result from an autocratic decision, AI, AII, CI, and CII are eliminated from the plausible set.

7) The acceptance priority rule. ($E \cap \bar{G} \cap G \Rightarrow \overline{AI}, \overline{AII}, \overline{CI}, \overline{CII}$) If acceptance is critical, not assumed by an autocratic decision, and if subordinates can be trusted, AI, AII, CI, and CII are eliminated from the plausible set.

Application of these rules to a problem results in a decision tree as shown in Figure 1. Across the top are the problem attributes, A-G. For any given problem, starting from the left and working toward the right, one asks the "yes-no" dichotomous questions that are encountered. At each terminus location, the number designates the problem type along with the decision processes that remain applicable after the rules have been applied. It can be seen that all problems that have no quality requirements and in which acceptance is not critical are of Type 1. Type 2 refers to all problems for which quality is not a concern, acceptance is critical, and the prior likelihood of acceptance by subordinates of the leader's decision is low. The same decision process flow defines the other types as well.


A
B
C
D
E
F
G
State the Problem
NO
YES
NO
YES
1: AI,AII, CI, CII, GII
2: GII
NO
YES
NO
YES
3: AI,AII,CI, CII,GII
4: AI,AII,CI,CII
YES
5: GII
NO
YES
6a: CII
6b: CI,CII
7: AII,CI, CII
3: AII,CI,CII ,GII
9: CII
10: CII,GII
11: GII
12: CII

A. Is there a quality requirement such that one solution is likely to be more rational than another?
B. Do I have sufficient info to make a high quality decision?
C. Is the problem structured?
D. Is acceptance of decision by subordinates critical to effective implementation?
E. If I were to make the decision by myself, is it reasonably certain that it would be accepted by my subordinates?
F. Do subordinates share the organizational goals to be attained in solving this problem?
G. Is conflict among subordinates likely in preferred solutions?

FIGURE 1. DECISION–PROCESS FLOW CHART FOR GROUP PROBLEMS.

As illustrated earlier, there are some problem types for which more than one decision process remains in the feasible set. When this occurs, Vroom and Yetton (1973) list a number of alternative decision rules that can be employed. For example, the number of man hours required in solving the problem may be an important consideration given a set of decision processes that equally satisfy both quality and acceptance requirements. The method that requires the least investment in man hours is farthest to the left and is the most autocratic within the feasible set. If investment of man hours is not of immediate concern, one might be more interested in the development of subordinates rather than the conservation of time. Exclusive weight on development would lead us to the most participative process in the feasible set (the one farthest to the right).

In an attempt to validate the model, Jago and Vroom (1976) had leaders describe, in written form, a recent problem they had to solve in carrying out their leadership role and to specify the decision process used in making the decision. The data generated from these "recalled problems" were used to determine how frequently the managers' reported decision processes corresponded to the normative model. In other research, managers were asked to select one successful and one unsuccessful decision. The results showed that "if the managers' method of dealing with the case corresponded with the model, the probability of the decision being deemed successful was 65 percent; if the method disagreed with the model, the probability of its being deemed successful was only 29 percent" (Vroom, 1976, p. 20).

Another research method, labeled "standardized problems," evolved around the construction of a standardized set of cases that involved decision making problems. It is worth noting here that managers are responding to incidents that they may have never experienced or never will. Be that as it may, Jago and Vroom (1976, p. 11) report that "analysis of correlations and similarity scores support the hypothesis that statements of intended behavior on problem set cases are predictive of actual behavior in similar but real decision-making situations."

Not everyone agrees, however. The fact that actual behavior is never really measured is disturbing to some critics (Schriesheim and Kerr, 1977). Managers are only asked what they would do! Self-reports on "behavioral intent" seem to form the basis of the model's validation; however, numerous studies (e.g., Jones and Nisbett, 1972; Nisbett, Caputo, Legant, and Marecek, 1973) show that self-reports are not statistically the same as descriptions of the leader by others.

Another shortcoming is that Jago and Vroom seem to treat leadership and managerial behaviors interchangeably. In fact, the model focuses on only a small aspect of managerial behavior--that of subordinate participation in the decision making process. This raises a serious question of how applicable the model is to other settings. Could the model be used profitably in an engagement simulation (ES) setting? Since the model addresses only a few of the numerous variables involved in ES, at best it would account for only a small portion of the total variance. It should also be remembered that the subordinates in Jago and Vroom's (1976) study were no less than mid-level managers themselves, equivalent to perhaps captains in the U. S. Army with respect to level of responsibility. The subordinates in which we are interested--those who compose a platoon--are not as sophisticated nor do they have the same decision making experience as Jago and Vroom's subjects. The whole issue and relevance of the Vroom and Yetton model may be superfluous if PFCs and Corporals, either because of personal shortcomings or Army doctrine, are excluded from any decision making responsibility.

All of the above approaches have heightened our understanding of the intricacies involved in the leadership process. Investigators have learned, however, there is no singular approach that will answer all their questions concerning leadership. The present writers found this even more true after examining the literature with a specific purpose in mind--that of identifying leadership factors and processes affecting the outcome of ES exercises. No one, to our knowledge, has developed a leadership model solely for this purpose. It has been stated (Schriesheim and Kerr, 1977) that all current leadership theories and models share two characteristics in common: 1) none of them systematically accounts for very much criterion variance, and 2) all of them unconditionally assume--regardless of the circumstances--that leadership is the most significant determinant. And what of the situational approaches? Even they assume that there is going to be an appropriate leadership style for each situation encountered. It may well be that there are many situations for which leadership behaviors (as studied so far) are irrelevant.

An Information Processing Approach

One general avenue of approach that strikes us as promising is to view the leaders and subordinates in ES as processors of information or as problem solvers. A human information processing view is a relatively recent arrival as far as approaches to leadership are concerned. An interesting paper by Wynne and Hunsaker (1975), which focuses on how the actions of task-group leaders and subordinates are mediated by each member's cognitive style, is representative of this approach.

The importance of information and how it is processed, organized, and acted upon in relation to a leadership context has already been demonstrated as a topic amenable to empirical investigation. One interpretation of Fiedler's LPC score is an index of cognitive complexity, that is, the degree to which an individual or group differentiates and integrates information (Driver and Streufert, 1969). Foa, Mitchell, and Fiedler (1971) suggest that leader success may well be conditional upon a match between the complexity characteristics inherent in the group task and the level of cognitive functioning demonstrated by the leader. A good example comes to mind. At ES exercises at Fort Pickett (1978), one particular squad leader soon acquired a moderate degree of respect for his ability to maneuver cleverly and, using his six-powered scope, site opposition forces in simple individual combat situations. However, when the problem became more complicated and he was put in the position of reading map coordinates and adjusting artillery, he spent 20 minutes in one location trying to figure out how it could be done. His level of cognitive functioning did not match the task, and he and his squad were rendered casualties by the opposition's indirect fire.

Rice and Chemers (1973) found that leaders high in cognitive complexity were more flexible across different situations than low complexity leaders. It has also been found that optimal job complexity (neither too high nor too low) produces greatest performance and satisfaction (London and Klimoski, 1973). Highly relevant to the relationship between information processing and effective leadership is Ryan's (1970) treatment of intentional behavior. Individuals direct their own behavior (and the behavior of others) when: 1) they are exposed to information about an issue, 2) they perceive the information as important to themselves, 3) they are able to integrate the information, and 4) they conceive of situation-relevant alternatives based upon the processed information. In accordance with Ryan's conceptualization, House (1973) and Dessler and House (1972) find that a high amount of information is required for effective behavior in conditions of low task structure and role ambiguity. In the ES situation, task structure and role clarification deteriorates soon after the platoon leader is killed. Survival of the platoon often depends upon how well group members respond to cues and other sources of information regarding the enemy's movement. Berlo (1974) has shown that as uncertainty and complexity increase, access to and control of information displaces formal authority as a primary source of influence.

A closely related way of conceptualizing leadership skills in the ES context is to look at the platoon or squad leader as a problem solver. We view problem solving as a skill. Like any other skill, it is something that a person acquires rather than an innate quality. Proficiency with problem solving is thus dependent upon practice, the acquisition of subskills, and their subsequent execution. It relies on past experience, is subject to further development through appropriate training, and involves the coordination of complex component processes such as responding to cues, organizing information, generating ideas and evaluating alternative courses of action. Strategies are employed and give direction to one's activities. When the problem solving task involves many members, the general level of execution is strongly affected by the adequacy or inadequacy of each member's skills. Inability to perform these required skills has often been observed in ES exercises.

Against The Mainstream

Contributing to the diversity of the research literature, a number of individuals, each marching to a different drummer, seriously question much of what is being done in the field. One of those who has departed from the mainstream is Argyris (1976a, 1976b). As it concerns leadership, Argyris objects to much of the current research literature, which he characterizes as Model 1 behavior. Model 1 behaviors are characterized by the desire "(a) to define unilaterally the purpose of the situation; (b) to win and not to lose; (c) to suppress feelings; and (d) to emphasize intellectual aspects of everyday life" (Argyris, 1976c, p. 639). According to Argyris, such behavior tends to generate dominance, defensiveness, deception, and manipulation in people. The receipt of valid feedback is inhibited by unilateral control. As an alternative, Argyris promotes Model 2 behavioral patterns, characterized by open inquiry, mutual trust, and shared decision making. It is implied that Model 1 behaviors are inherently bad because they do not promote personal growth. Argyris notes that it is not too difficult to get people to espouse the principles of Model 2, but it is extremely difficult for people to actually put the principles of Model 2 into use. They tend to fall back on Model 1 behaviors. Such findings are not surprising, given the disappointing results of research on T-groups as it relates to leadership (Stogdill, 1974). It is fairly easy to adopt and verbalize the principles of openness and trust in a T-group setting; however, these principles are rarely reflected in significant changes in interpersonal effectiveness in the work environment (Campbell and Dunnette, 1968; House, 1967).

Another work that critically questions current approaches to leadership is a collection of widely divergent papers edited by McCall and Lombardo (1977) and entitled Leadership: Where Else Can We Go? Although the papers are not empirically oriented, the major criticisms are, none-the-less, germane. Among the major criticisms, also made elsewhere, are: (a) leadershp is assumed to be invariably important--the sine qua non, to the neglect of other factors; (b) research limits and imposes a uniformity of leadership behavior that does not really exist in the real world; (c) it neglects to look at the overall system, of which leadership is only a part; and (d) the issues and problems that are addressed are basically insignificant ones. In the same book, Pfeffer (1977) comments on the difficulties that ambiguities of leadership definitions cause in studying leadership. He also notes that, compared to other variables, leadership has not been shown to have a reliable impact on organizational performance. The criteria used to select leaders are often irrelevant considering the missions of the organization.

Pfeffer has furthermore turned to the literature on attribution theory in an effort to make sense out of leadership findings. Often success or failure is attributed to the leader in spite of his actual impact on organizational outcomes. Heller (1971) has found, for example, that senior subordinates of managers tend to overestimate their involvement in the decisions of their superiors when compared to the reports of the superiors themselves. According to Jago and Vroom (1975) "the subordinate, himself a manager, exaggerates his role in the decision process creating in his subordinates the inaccurate perception of his responsibility for the outcome. The subordinates...are likely to thus infer use of an autocratic mode of decision-making at the level of their own superior when in fact the actual process used may have been of another type" (pp. 27-28).

Attribution theory also tells us that we are likely to make situational attributions when it comes to inferring the causes of substandard outcomes that personally concern us, but when the same substandard outcomes involve others, we are likely to make dispositional attributions. For example, if Harry doesn't receive an expected raise he may attribute the cause to the poor fiscal earning of his company, but if Sam in the next office doesn't receive a raise, Harry is likely to make a dispositional attribution (e.g., Sam's level of competence doesn't warrant a raise). Vroom (1974) cites the following research in support of what is known as the attribution error:

> "Results reported [from thirty-nine managers and eighty-nine subordinates, responding with respect to a set of thirty concrete but hypothetical situations] show significantly less variance...in subordinates' descriptions of their superiors' behavior than in either the subordinates' or supervisors' self-descriptions. Since situational variance is the antithesis of a generalized trait, this finding can be interpreted as consistent with Jones and Nisbett's conclusion (1972) that actors tend to attribute their actions to situational requirements and the actions of others to stable personal dispositions" (p.25).

Along these same lines, Rush, Thomas, and Lord (1976) note that in studies using questionnaire measures of perceived leader behavior an unknown proportion of the effects attributed to the leader's actual behavior may instead stem from other sources. Rush et al. elaborate further on why subordinate descriptions of leader behavior may be biased:

> "It seems unreasonable to assume that raters perceive and remember all the leader behavior displayed in a given situation and then are able to accurately access this information at a later time when filling out a behavioral questionnaire. What is more likely is that raters rely heavily on stereotypes and implicit theories to reduce the amount of information processing required in perceiving and understanding the behavior of others" (pp.14-15).

Ilgen and Fujii (1976) have found that subordinate descriptions of leader behavior tend to be statistically unrelated to descriptions by independent observers and are also unrelated to descriptions by the leaders themselves. This awareness that leaders are perceived objects is certainly bound to figure in subsequent research, the issue is not merely academic. Calder (1976) advocates that future research not only identify what variables affect the perception of leadership, but also that research efforts should focus on the underlying nature of the attribution process.

As the diversity of the above studies attests, the task of trying to characterize the research literature is not an easy one. It would be presumptuous to expect the research literature to be organized in such a fashion as to render a discernible listing of leader skills and group interactive processes. Therefore, our interest in what follows is to focus on the literature as it pertains to the leader skills we have identified and to draw also from relevant combat and ES experience of research personnel. From these primary sources, we hope to establish a rational framework upon which a useful taxonomy can be constructed.

A Leadership Taxonomy for Tactical Settings

On the basis of historical ES data (battle narratives, audio tapes, and net control sheets collected at ES execises), the literature research, and research staff ES/combat experience, a listing of leader skill categories (Appendix A) and individual leader skills (Appendix B) was developed. The skill categories were arrived at inductively by listening to audio tapes and examining battle narratives, listing the individual skills involved, and arriving at a general skill category under which the numerous individual skills could be subsumed. If there was a parallel skill category already existing in the research literature (e.g., initiating structure) that consisted of the same skills involved in ES, it was readily adopted. Many of the skill categories, however, did not have identical counterparts in the research literature. Appendix A shows the identified skill categories, subsumed under five broader headings, as follow: (a) management skills--planning, execution and control, initiating structure, and interacting with subordinaes and superiors, (b) communication skills--transfer of information, and pursuit and receipt of information, (c) problem solving skills--identification and interpretation of cues, weighing alternatives, and choosing a course of action, (d) tacitcal skills--application, and (e) technical skills--equipment and basic.

It should be noted that the skill categories are not mutually exclusive. At times, one could think of two, sometimes three, skill categories under which a particular skill could be placed. A matrix of individual skills for each of the skill categories is reported in Appendix B. To the extent possible, these skills have been cast in the form of opertional definitions. In addition, the research staff addressed each individual skill deciding: whether the skill clearly occurs in a tactical situation, the most appropriate skill category under which the skill could be placed (primary relationship), and to what other skill category the skill relates (secondary relationships).

It has been mentioned that the leader skills and categories do not exist independently of one another, nor are they static, as a simple chart or listing may suggest. For ease of exposition, the skill categories are treated individually in what follows. However, it is best to remember that they collectively interact in a very intricate fashion.

Management

The relation between management and leadership has not been a topic of systematic inquiry. Surely, there is a relation, but it is not easy to delineate. Most definitions of leadership assume a process of interpersonal influence or interaction:

> "Leadership is the process of influencing group activities toward goal setting and goal achievement" (Stogdill, 1948).
>
> "Leadership is the initiation of acts that result in a consistent pattern of group interaction directed toward the solution of mutual problems" (Hemphill, 1954).

Leadership thus posits a relation among people whereby the influence is unevenly distributed. The necessary complement to leadership is followership--the two do not exist in isolation. Accordingly, managers whose work involves the direction and supervision of other people are in leadership positions. However, not all managers have supervision over employees. Some, like a produce manager in a supermarket, manage things, not people. Thus, not all managers are in leadership positions. What about the converse relationship? Can we have leadership without management? It should not be very difficult to demonstrate such a case. A leading microbiologist may have great influence in the scientific community without exercising managerial responsibilites.

It is usually the case, however, that leadership and managerial positions overlap; managers find themselves in leadership positions, and leaders perform managerial functions. The infantry platoon leader is a good example. His primary role is that of a leader; he has considerable influence on the activities of fellow platoon members toward mission attainment. He is also a manager who must engage in such duties as identifying training needs, planning, providing logistical support, and supervising equipment maintenance.

A useful technique for identifying important aspects of managerial behavior has been the critical incident method developed by Flanagan (1954). A study by Williams (1956), reported in Campbell, Dunnette, Lawler, and Weick (1970), illustrates the use of this technique. Williams recorded 3500 critical incidents of effective and ineffective managerial behavior from a pool of 742 executives in various companies. These incidents were grouped into the following categories:

Planning, organization, and execution of policy
Relations with associates
Technical competence
Coordination and integration of activities
Work habits
Adjustment to the job

Planning, organization, and execution of policy, good relations with subordinates, and sound work habits were most frequently associated with effective incidents.

A problem inherent to the development of a system of categories that is to have wide applicability for a variety of organizations lies in the loose fit that often exists between the system and one's particular organization. In the attempt to develop a system that has considerable breadth and scope, the trade-off is usually a lack of fidelity to the group or organization of immediate interest. Because of the unique demands of different organizational settings, one is often better off in deriving one's own listing of critical incidents for effective and ineffective managerial behaviors. The critical incidents method poses another problem. The Williams study tells us, for example, that the effective manager "demonstrates ingenuity in solving management problems" and "perseveres in efforts to reach objectives." It does not tell us, however, how one should go about "demonstrating ingenuity" or "persevering". We need to somehow delineate the behaviors our manager will display when "demonstrating ingenuity" or "persevering". Otherwise, resultant training programs will be based on lofty platitudes alone. The greatest value of the critical incident method lies in pinpointing functional areas of management in which effective and ineffective behaviors are likely to occur.

An examination of the skill categories chart (Appendix A) shows that management is used at a relatively high level of abstraction. As a broad and multifarious term, it needs to be anchored to reality, preferably a tactical military setting. We have already referred to the Clark (1955) study on leadership functions at the squad level during the Korean conflict. This study clearly showed that managing the squad was the most frequently occurring leadership function and that it was the squad leader or assistant squad leader who most often performed this function. Clark (1955) was also fairly explicit in what he meant by managing the squad. It involved supervising the distribution and maintenance of supplies and equipment, serving as a channel of communications, and insuring that assigned missions were carried out.

Traditionally, management refers to the efficient handling of assets. In the ES context, these assets include people, equipment, and support elements. Based upon our analysis of audio tapes and battle narratives from various ES exercises and the listing of individual skills that resulted, four clusters or functional areas of management became discernible. These were: planning, execution and control, initiating structure, and interaction with subordinates and superiors. The critical incident study of Williams, discussed above, lends support to our analysis. Despite slight differences in terminology, it is interesting to find that Williams' categories of a) planning, organization, and execution of policy, and b) relations with associates are very similar to three of our management skill categories of planning, execution and control, and interaction with subordinates and superiors. Our other management skill category, initiating structure, was, in turn, a frequent functional skill area in Clark's infantry squad study. Clark (1955), it will be recalled, used the phrase "defining rules and procedures for acceptable behavior." As a skill area, initiating structure has held a prominent position in the leadership literature. We shall now examine our four manaagement categories in greater detail.

Planning. Planning is considered a managerial skill in various treatments of leadership (Williams, 1956; Fiedler and Chemers, 1974; Uhlaner, 1970). While many authors cite planning as an important managerial skill, they do so in a relatively glib fashion. "Of course, a manager has to be a good planner!" is the standard line. What constitutes a good planner is much harder to specify. One needs first to consider the context. In an ES or combat setting, planning refers to formulating the means by which a tactical operation is to be executed and achieved. A well-formulated plan, according to FM100-12 Staff Officers' Field Manual - Staff Operations and Procedures (1977) is one that takes into account all things normally included in all Army Operation Orders: objective, enemy situation, friendly situation, concept of operation, execution, and command and signal. An analysis of tactical operations often reveals that the success or failure of an operation can be traced to the adequacy of the plan. The following combat experience of Jones (1969) illustrates this point.

In Quang Tri Province, Vietnam, a rifle company was given the mission to assault a hill occupied by enemy forces. The assault was launched from an adjoining hill occupied by remnants of a sister company. This company had taken heavy casualties in a day of fighting. The company commander's plan for assaulting the hill included the following: 1) artillery fire and tactical air strikes against the enemy positions on the hill, 2) a covering element to lay down suppressive fire with machine guns and Light Anti-tank Weapons (LAWs), 3) a two-platoon advance up the hill with Company Headquarters moving with the left flank platoon, 4) a support element to fire five E-8 riot gas launchers (each launcher contained 28 gas rocket pods), and 5) attacking platoons were to don gas masks one-half to two-thirds of the way up the slope. This command was given over the command net. A red star cluster was the back-up signal for launching this gas attack.

The operation was successful. The gas attack was launched against the enemy occupying the hill. The North Vietnamese Army (NVA) was not equipped with gas masks and was forced to withdraw. The two attacking platoons occupied the hill with only two wounded. Jones attributes the success of the operation to effective planning. An analysis of the enemy situation told the company commander he could expect heavy resistance. The day before, a company assault against enemy positions had resulted in heavy casualties. The same company had been overrun during the night. Another company was surrounded and cut off from the battalion. Expecting heavy resistance, the company commander's plan for assaulting the hill had two major components: 1) to organize the platoon as a covering force so it could adequately place effective suppressing fire, the number of machine guns was doubled and the number of LAWs (M72 rockets) was tripled, and 2) to surprise the enemy with an unexpected tactic, the company commander anticipated the NVA would not have gas masks and that such an attack would force the NVA to withdraw. Timing was important. The gas could not be fired too early. If it was, the gas would dissipate and the NVA could re-occupy the hill before the attacking platoons reached the top. This part of the plan involved further components: a) selecting a gas launch element and training the element during the night, b) developing a plan for when the gas would be fired, which included back-up signals in the event of radio breakdown, and c) issuing and testing gas masks for the attacking platoons.

The importance of planning is readily revealed when its absence produces disasterous effects. During an ES exercise* in Wildflicken, West Germany (1974), an infantry platoon leader was given the mission to delay an approaching tank column. The platoon leader did not develop a plan that took into account the disposition and coordination of the weapons systems that were available to him. These were 90mm Recoilless Rifles (RRs), M72 LAWs, heavy anti-tank mines, and controlled demolition. The platoon leader also did not formulate a plan for withdrawal. Apparently as a result of the planning omissions, the delay force damaged only one tank and was partly overrun. The withdrawal was characterized by confusion and part of the force and its equipment were left behind.

Garland (1967) tells of the fatal impact of planning oversights as well. In 1965 in Quang Ngai Province, Vietnam, a U. S. rifle company was conducting a sweep operation. The company commander left the weapons platoon on a hill to provide fire support for the company as it conducted its sweep into a valley. He did not plan additional security for the weapons platoon. Two hours after the company had left the weapons platoon, it was attacked by a Viet Cong force and overrun. This planning oversight resulted in 16 men killed and six wounded. The Viet Cong also collected 18 individual weapons, ammunition, and two radios.

The relation between planning and other managerial skill categories is a close one. In fact, planning helps to lay the groundwork for our next skill category, execution and control.

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*All references to ES exercises are based upon observations of Kinton research personnel.

Execution and control. As far as we can determine, there are no equivalents to what we are calling execution and control in the managerial or socio-psychological literature. An approximation to our intended meaning comes from the military literature. Helme, Willemin, and Grafton (1971) delineated eight general factors of officer leadership in a simulated combat situation, two of which were command of men and executive direction. According to these authors, command of men refers to the direct command and control in a field operation while executive direction, for the most part, refers to timely and decisive actions and organizing ability. Execution and control of a tactical unit is a highly complex skill that is dependent in varying degrees upon other skills (e.g., planning, communication, technical). A breakdown in any one of these skill areas immediately lessens execution and control. Jones' combat experience in Vietnam (1969) is, once again, illustrative.

An infantry tank company team in Quang Tri Province was attempting to surround and destroy an enemy unit. The company team commander was maneuvering three rifle platoons and a tank platoon in an effort to trap the enemy unit. As these elements were constantly changing positions in anticipation of the enemy direction of retreat, the need for effective execution and control was paramount. Contact with the enemy force caused the company team commander to move his second platoon to a new blocking position on a ridgeline. This change was not clearly relayed to the tank platoon leader. Approximately an hour later the tank platoon spotted movement on the ridge. Assuming the movement was the enemy force, the tank platoon opened fire with their main guns. This execution and control error by the company team commander resulted in seven dead and 13 wounded among the second platoon.

Leader difficulty in maintaining adequate execution and control has also been apparent in ES exercises. At Fort Lewis, Washington, in August 1974, during an ES exercise, a rifle platoon was conducting an assault on a bunker complex. Elements of the platoon had made contact, and part of the platoon was also receiving some indirect fire. The platoon leader had decided to call for artillery support before continuing his assault. However, at that time, the platoon leader was not aware that one of his squads had penetrated the right flank of the bunker and was still advancing. The platoon leader had not received this information on the platoon radio net. Incoming artillery, sporadic small-arms fire, casualties, dense woods, and undergrowth all contributed to the confusion on the battlefield and hindered the platoon leader from knowing the exact status of his unit. The word to pull back was passed, but the squad that had penetrated the complex did not receive this information and was caught in the artillery barrage. Twelve casualties resulted from this loss of control. These additional losses weakened the platoon so badly that the assault could not be sustained.

The above examples show that execution and control is the actual implementation and follow-through of a tactical operation plan. It is a multifaceted skill area representing an intricate composite of other skills such as effective employment of men, maintaining communications, contingency arrangements, setting a standard, and making timely and unequivocal decisions.

Initiating structure. As mentioned earlier, the term initiating structure originated from the work of Hemphill (1949b) and was further isolated in several factor analytic studies of questionnaire item intercorrelations (Halpin and Winer, 1957). It is one of two leadership factors that has undergone extensive research during the past 20 years, most notably by Fleishman and his colleagues (Fleishman, 1973). Because the term is already well defined and understood by investigators of leadership, we have chosen to retain the term as it is used in the psychological literature. Essentially, this definition refers to the extent to which leaders are likely to define and structure their roles and those of their subordinates toward goal attainment. Initiating structure involves acts that demonstrate that the leader organizes and defines tasks to be completed. People are assigned to particular tasks and deadlines are set.

The need to define roles and tasks is extremely important in tactical operations. The success of an operation is dependent upon leaders and their elements fulfilling the combat role assigned to them. The failure to understand or comply with the assigned mission is often the cause for the failure of a tactical operation.

In June 1969 in Quang Tri Province, South Vietnam, a reconnaissance team was given the mission to acquire intelligence on enemy activities in a particular area of operation (Jones, 1969). The team was to avoid contact as the mission was strictly one of gathering intelligence. The team operating in the assigned reconnaissance zone came upon approximately 15 NVA soldiers eating an evening meal. Instead of reporting this information and plotting the coordinates, the reconnaissance team commander decided to ambush the NVA force. The reconnaissance team initiated a hasty ambush and soon found themselves surrounded by a large NVA force. The team had actually stumbled into an NVA base camp. The team took several casualties and a reactionary force was committed to rescue them. This force also took heavy casualties and the fighting continued through the night. By not understanding or fulfilling his assigned role, the reconnaissance team commander was not only responsible for unnecessary casualties, but also allowed a large enemy unit to escape before a coordinated operation could be launched against it.

Initiating structure is especially important in combined arms operations. Here the need for defined roles and tasks among the elements of a combined arms team is essential for unit success. Given the lethality of modern weapons systems and the need to suppress those systems, each element of a combined arms operation must have a clear understanding of its role and how it relates to other elements for attainment of the mission. The ES exercises in Wildflicken, Germany (1974) provide an apt example. A combined arms team was advancing against forces with anti-tank capabilities. The task force commander had employed his infantry to the front of the advancing tanks to provide a "protective umbrella" for his armor. Tank commanders were instructed not to bypass the infantry. However, the tank commander of the light section bypassed the infantry as he advanced along the left flank axis. The two tanks were engaged by enemy weapons systems and destroyed. Of the elements of the combined arms team (tanks, infantry, anti-tank elements, and artillery), it was the tank commander who departed from the existing structure. In brief, a departure from defined roles by any one element can diminish the chances for unit success.

Interaction with subordinates and superiors. Our use of the phrase "interaction with subordinate and superiors" closely parallels what the leadership literature refers to as "consideration." The Ohio State Leadership Studies, previously examined, isolated consideration as a prominent leadership dimension--the counterpart to initiating structure. For the past 25 years it has been extensively studied (Fleishman, 1973). Basically, this dimension refers to the degree to which an individual's interactions with subordinates and superiors promotes mutual trust, respect, high morale, group cohesiveness, and ultimately, progress toward goal attainment. Relations with associates, it will be remembered, was one of the functional managerial areas of the Williams' (1956) study. Good interpersonal relations with one's peers is an attribute, variously labeled, that appears many places in the literature (e.g., McGregor, 1960; Blake and Mouton, 1964). We prefer the term "interaction with subordinates and superiors" because we find it more descriptive for a military setting.

The leader's interactions with others need not be fixed, but should adapt to changes in the situation. In certain situations, a very directive, hard-nosed, task-oriented style of interaction with subordinates will be most effective (e.g., if they are procrastinating in digging defensive positions, a kick in the pants may work best). At other times, however, an approachable, person-oriented style of interaction will be most effective (e.g., a frustrated subordinate may be trying to do a good job and only need encouragement rather than a reprimand for his failures).

In combat, how well a leader develops mutual trust and support in his squad or platoon depends on his ability to keep his men alive. The overriding concern of soldiers in combat is survival. Soldiers identify with the leaders whom they feel offer the best chances of surviving an engagement with the enemy. In a very short time the good units and bad ones (and good and bad leaders) are commonly known among the soldiers and small unit leaders. For example, in Vietnam, Delta

Company enjoyed initial success against the enemy (Jones, 1969). In one month, D Company killed approximately 60 enemy while suffering only two wounded. The soldiers in that company had confidence in their leaders and believed they had a good chance of surviving. In another company in the same battalion, heavy casualties were sustained on more than one occasion. The word was quickly out that one's chances "for making it" in that company were not good. Group morale and cohesiveness were serious problems.

The same identification process has been observed in ES exercises. During 19 weeks of observation of ES exercises at Fort Lewis, Washington and Wildflicken and Berlin, West Germany, it was quite apparent to the authors that soldiers identified with the leaders with the best performance records. Leaders whose units continually suffered heavy casualties were often subject to open criticism and ridicule. On the other hand, leaders who were successful seemed to emerge as folk heroes. One such incident occurred in Wildflicken. A defensive force had suffered a series of setbacks. Leader roles changed and a platoon sergeant was given the mission of defending a town against a tank infantry assault. The new leader planned a detailed defense of the village that included anti-tank mines and controlled demolitions covered by 90mm RRs on the main tank approaches into the town. The defense was successful; four tanks were destroyed as well as most of the advancing infantry. The sergeant received numerous accolades from his soldiers and was recognized as a leader who could perform well in a battle situation.

Communication

Communication can be studied as a group process or as an individual skill. We shall pursue both approaches. In a well-known series of experiments, Leavitt (1951) investigated the effects of various patterns or networks of communications upon group behavior. In the standard procedure, positions at a table are separated by panels so that group members are unable to see or speak to one another. Communication networks (e.g., circle, chain, Y, wheel, star) are established by keeping certain slots on the panels opened and others closed. In the "circle" network, a person can only communicate with adjacent neighbors. In the "wheel," all communications must pass through the person occupying the nodal position of the wheel. The problem facing the five-member group was to identify the single symbol that each member held in common on a card containing several symbols such as a triangle, square, and asterisk. It was found that stable organizations developed by the fourth or fifth trial in the more centralized networks but not in the circle. In the wheel, Y, and chain, the individual in the most central position transmitted more messages than any other individual in the centralized groups. He enjoyed his job more than did peripheral members and was designated as the leader on the post-experimental questionnaire. The most inefficient group was the circle; this group sent the most messages and made the greatest number of errors in trying to identify the common symbol. Group member satisfaction, however, was greater for members of the circle group than for peripheral members of the centralized groups. In an interesting review by Shaw (1964) of his own and others' work, centralized networks were found more effective in solving simple problems of information exchange but decentralized networks were more effective on problems characterized by complexity and ambiguity.

Communication network research will undoubtedly uncover other interactions. The present line of research is significant in that it clearly shows that leadership emergence is strikingly affected by communication arrangements and that the most influential person is usually the one privy to all communications. It is interesting to note that the same findings that occur in Leavitt's artificially imposed laboratory study hold up in real life settings as well. Kipnis (1957) studied the effect of communication in B-29 bomber crews and obtained similar results. Individuals who, because of their crew positions, had the most interaction with the other members of the crew also tended to be most frequently chosen as most influential by them.

Spatial and physical arrangements have been shown to affect leadership emergence as well (Steinzor, 1950; Bass, Klubeck, and Wurster, 1953; Howells and Becker, 1962; and Sommer, 1961). In a three-person group, for example, the person sitting alone at the table facing the others will be perceived as the leader. It is noteworthy that even minor differences in the physical setting help to determine who becomes a leader. These physical factors play a relatively minor role, however, and whatever impact they would have in an ES setting is likewise suspect.

When we initially constructed our taxonomy of skills, it was soon realized that communication was perhaps the most pervasive of the collection. In fact, it is difficult to think of another category with which it does not interact. Nonetheless, our individual communication skills revealed two sub-sets that could be identified: skills that were concerned with the transfer of information and skills that involved the pursuit and receipt of information. Transfer of information will be discussed first.

Transfer of information. Apart from the studies on communication networks (e.g., Leavitt, 1951) and spatial arrangements (e.g., Howells and Becker, 1962), research on the actual transfer of information with respect to leadership is scarce. On the other hand, the effect of exclusive possession of information upon leadership emergence has been studied. Results from various studies indicate that the possession of task-relevant information provides an advantage in attempting and gaining leadership in a group (Hemphill, Pepinsky, Shevitz, Jaynes, and Christner, 1956; Shaw and Penrod, 1962; Shaw, 1963; Rudraswamy, 1964). One important difference between the studies on leadership emergence and ES is that in the latter situation the leader is appointed rather than emerges. Still, the lesson to be learned from the literature clearly suggests that the individual who possesses information and knows how to handle it is often the most valued member of the group.

The experience derived from combat and ES exercises points to the criticality of transmittal of planned information and the acquisition of new information if tactical operations are to be sustained and effective. Inadequate transfer of information is often the reason for friendly casualties and mission failure. In an ES exercise at Fort Stewart, Georgia, in 1977, the point element of an attacking platoon detected a booby trap but failed to inform the following elements. The point team made contact with the enemy and, as the platoon moved forward to reinforce that element, the platoon leader and his Radio Telephone Operator (RTO) tripped the booby trap and became casualties. Consequently, for about five minutes there was no platoon control over the attacking squads.

Another example of the dire consequences of poor transfer of information skills occurred in an ES exercise in Wildflicken, West Germany in 1974. A TOW element as part of a defensive force, observed an approaching tank platoon split and move on each side of a long but narrow wooded area. It also observed infantry dismount and advance into this wooded terrain. The TOW element immediately took the near tank section under fire. However, another part of the defensive force, an infantry anti-tank element located in the woods, was not informed of the enemy activity. Consequently, the team was taken by surprise by the enemy infantry. As the team withdrew it came out on the other side of the woods, and the APC that contained the anti-tank element was taken under fire by the advancing tanks and destroyed. The 10-man anti-tank team was totally eliminated.

In a combined arms exercise in Wildflicken, West Germany, in 1974, a task force commander was informed by a forward infantry element that an enemy anti-tank team was tracking one of the advancing sections of tanks. The immediate and complete communication of this information was essential for preventing loss of one or more of the tanks. The commander, receiving the report of enemy activity and their location, was able to relay the information to the advancing tanks, which were able to take evasive action before the enemy TOW could engage. Immediately upon completing that transmission, the task force commander began to call for indirect fire on the enemy position using the infantry team to adjust the mission on target. This example shows the positive results that can be obtained through effective communications. It also demonstrates the importance of the other skill categories to effective communication skills. For example, initiating structure was clearly a contributing factor to the task force commander's good communication skills. The infantry squad fully appreciated the significance of their assigned role. By immediately reporting the enemy position and its location, the infantry elements were able to prevent tank losses. Slow or incomplete transfer of information here most likely would not have been good enough since seconds made the difference in avoiding equipment losses.

Pursuit and receipt of information. The first component, pursuit, reflects the degree to which the leader actively seeks out needed information and tries to keep informed on all matters pertaining to the mission. The second component, receipt, refers not only to whether vital information is relayed back to the leader but also to whether he is open and receptive to that information. Of the two components, the second comes closer to having a relation to the research literature. The willingness to incorporate advice from others and to share the decision making process with others is an attribute that appears many places in the literature. The Vroom and Yetton decision making model (1973), which we examined earlier, centers around the willingness to incorporate advice from subordinates. Others have spoken of democratic vs. authoritarian forms of leadership. Lippitt (1940), for example, found that a democratic form of leadership tended to provide group members with greater freedom for decision and action than an authoritarian or laissez faire pattern of leadership. More recently, Heslin and Dunphy (1964) and Reid (1970) also found greater member satisfaction with a leader who provided greater opportunity for participation.

In a tactical situation, failing to pursue needed information is relatively common among inexperienced platoon leaders. In many of the observed ES exercises, the platoon leader, upon being engaged, often called for counter-battery fire without knowing the exact location of elements of his unit. The usual result was that a sizeable part of the platoon was killed by the mission.

The above examples show how essential the transmittal of planned information and the receipt of new information are for successful tactical operations. In combined arms operations, the coordinated maneuver of task force elements is dependent upon continuous, complete, and accurate transfer of information. As the situation develops, new information must be accurately reported to and processed by the task force commander in the form of contingency instructions that are responsive to the constant changes inherent in combined arms engagements. This transfer of planned information, receipt of new information, and transfer of new information is a constant cycle that, if broken, immediately lessens the likelihood of accomplishing the mission.

Problem Solving

Interest in problem solving cuts across several academic disciplines. Any discipline that purports to understand and predict individual or group behavior must eventually concern itself with the processes that regulate and control efforts at problem solving and decision making. Some disciplines, such as managerial science, economics, and operations research take a normative or prescriptive approach while others, such as psychology and sociology, adopt a descriptive model where the attempt is to ascertain the antecedent conditions of problem solving. In the normative model, the leader's behavior is usually treated as the independent variable and the organizational consequences of the behavior are the dependent variables. With the descriptive approach, the leader's behavior is the dependent variable that, in turn, is a function of the individual characteristics and situational factors that compose the independent variables. These variables are shown in Figure 2.

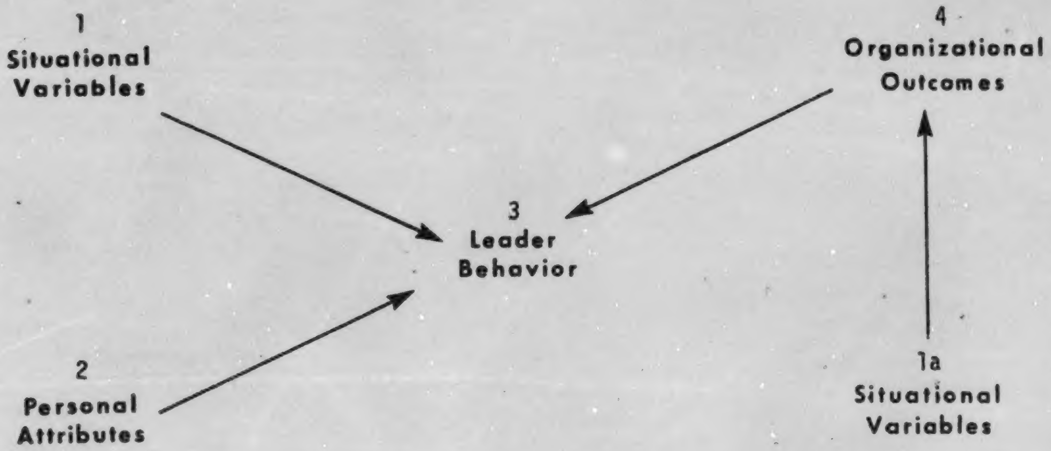
1
Situational Variables
4
Organizational Outcomes
3
Leader Behavior
2
Personal Attributes
1a
Situational Variables

Figure 2. Variables Used In Leadership Research

The psychological studies discussed earlier assumed that leader behavior (#3) was a function of personality traits (#2). This view was replaced by one that focused on situational determinants (#1) as the antecedent conditions of leader behavior (#3). Treating leader behavior only as a dependent variable is somewhat limiting. Vroom (1976) asserts, "there is strong *a priori* evidence that a theory which attempts to account for the behavior of a leader with only information concerning his personal attributes (such as his LPC score) or only of the situation he is confronting is automatically limited to explaining only a small portion of the variance" (p. 1537). If one starts with leader behavior (#3) in Figure 2 and moves to the right, leader behavior serves as the independent variable and organizational outcomes (#4) become the dependent variables. On this side of the figure, the relevant processes are organizational rather than psychological. What actions on the part of the leader are required in guiding the organization toward achievement of its external objectives? Vroom advocates the need for both descriptive models, in which leader behavior (#3) is treated as a joint function of situational variables (#1) and personal attributes (#2), and normative models, in which organizational outcomes (#4) are a function of leader behavior (#3) and situational variables (#1a).

Our own concept of problem solving is to treat it as a process as well as a skill. As indicated earlier, problem solving skill is something that a person acquires. Proficiency with problem solving is thus dependent upon practice, the acquisition of sub-skills, and their subsequent execution. Evidence to support the view that problem solving can be learned comes from numerous sources (e.g., Ray, 1957; Anderson, 1965; and Stern, 1967). One can trace interest in problem solving back to the writings of the old-guard Gestalt psychologists (Koffka, 1935; Kohler, 1924, Wertheimer, 1945). Although American behaviorism was predominant during this period, its reliance on past S-R associations did not do a very adequate job of explaining problem solving activity. Problem solving depends on previous learning, yet it goes beyond previous learning. Problem solving is distinguished from learning by the occurrence of a correct response or solution previously not within the individual's repertoire (Gagne, 1964; Johnson, 1972). Procedures for studying problem solving have centered on puzzles where the solution was not immediately available. The study of problem solving makes many psychologists think of Maier's (1933) pendulum problems, Duncker's (1945) paper clip and pyramid problems, Luchins' (1946) water jars, and Wertheimer's (1945) parallelogram. Problem solving ability, we know now, relies on past experience (in fact, past experience can impede problem solving as the well-known *Einstellung* and functional-fixity phenomena clearly demonstrate), is subject to transient motivational states of the organism as well as to situational and personal factors, and involves the integration of component processes into a new and higher order solution.

In the ES situation, these component processes can be classified as identification and interpretation of cues, weighing alternatives, and choosing a course of action. This classification scheme of dividing problem solving into three basic constituents approximates fairly closely events as they occur in ES--usually after contact is made. It represents our way of making sense of the ES problem solving process. It is interesting to note that Simon (1960) interprets of decision making in a very similar vein. According to Simon (1960), "Decision-making comprises three principal phases: finding occasions for making a decision; finding possible courses of action; and choosing among courses of action" (p. 1). Because problems encountered in ES vary enormously in their difficulty and scope, any given classification scheme is likely to fall short of doing full justice to the complexity of the phenomena under study. Consequently, all classification schemes should be regarded as tentative until they have proven their usefulness.

Identification and interpretation of cues. The first phase or process that we have listed is identification and interpretation of cues. In the ES context, a cue is either a sign of or contact with the enemy. Identification and interpretation occur almost simultaneously but they can be measured individually. Identification, therefore, can be operationally defined as recognizing a cue as an indication of an opposing force's actions, intentions, or presence. A cue can be of high or low visibility. An example of a high visibility cue would be contact with the enemy, whether directly (firefight, incoming artillery) or indirectly (booby traps or detonated mines). A low visibility cue would be one that indicates enemy activity in the not so distant area--a cigarette butt, footprint, or freshly broken tree branch. Interpretation of an identified cue can be defined as deducing the opposing force's disposition given the cue(s). In other words, does the leader make an effort to determine the significance of the cue? For example, given the detonation of a claymore, does the leader consider whether it was command detonated or booby-trapped? If command detonated, this should tell the leader that the enemy force is physically present and, therefore, his personnel should take protective action. If the claymore was booby-trapped, this should tell the leader that the mine may serve as an early warning device and thus the opposing force may be aware of their location.

Weighing alternatives. Weighing alternatives is not as easy as it may first appear. Cognitive psychologists have shown that the tendency to produce solutions immediately often interferes with the opportunity to develop new cognitive structures and alternative response patterns. Several experiments on a variety of problems have shown that when subjects are instructed to wait rather than to start the solution immediately, problem solving performance is improved (Cohen, 1954; Duncan, 1963; Ray, 1957). Thus, an effective aid to problem solving is to inhibit the immediate impulse to respond first and to think later. This does not mean that one can wait forever before responding. Another obstacle to the weighing of alternatives is Duncker's (1945) concept of functional-fixity, the inability to see beyond the usual function for an object. Becoming "trapped by the stimulus object" accounts, in large part, for the lack of ingenuity, resourcefulness, and flexibility that we observe in many futile problem solving efforts. The inability of subjects to perceive other than the prescribed use of objects has also been documented by Adamson (1952). In a polemical piece of writing entitled *On The Psychology of Military Incompetence*, Dixon (1976) has singled out military leadership as especially vulnerable to a certain ridigity of thinking. While Dixon would be hard put to demonstrate that the military has a monopoly on rigidity, the survival record of social units that succumb to it, is not very impressive.

In weighing alternatives, one assesses the likely consequences of each action. Given that the claymore, in our last example, was command detonated, at least these possible courses of action exist. One can: 1) assault the enemy position, 2) withdraw and consolidate force, or 3) maneuver force around and by-pass danger area. The consequences of assaulting the position would be the probable sustaining of casualties through direct and indirect fire. Withdrawing and consolidating the force could also result in indirect fire casualties. Maneuvering and by-passing the danger area could result in no casualties and denying the enemy force any knowledge of your location.

Choosing a course of action. In the ES battles that Kinton has monitored, we have observed on more than one occasion inactivity on the part of the leader, once contact has been made. Sometimes the leader will stay in one position for as long as 30 minutes. The result of failing to decide on a course of action is usually heavy artillery casualties. Once the alternative courses of action have been weighed, the leader must select the alternative that leads to the most favorable consequences. Moreover, he must decide on a timely course of action that will verify his estimates of enemy activity or provide further cues to make a better determination of the enemy situation. Depending on the mission, such a course of action may be directed toward avoiding casualties and denying the enemy information on your location.

The importance of deciding on a timely course of action appears in the military leadership literature as well. Uhlaner (1970, 1975), in his factor analytic studies, speaks of proficiency on tasks requiring decisive and timely action under his factor of executive direction.

Generally speaking, the three processes of identification and interpretation of cues, weighing alternatives, and choosing a course of action occur in the sequence discussed above. The cycling of processes, however, may not be as orderly as this sequence suggests. The flow of events need not be unidirectional. The weighing alternatives phase may need more information or cues for adequate assessment. A course of action may be decided upon to obtain more cues. There are problems at any given phase that generate sub-problems that, in turn, have their respective components of identifying and interpreting cues, weighing alternatives, and choosing a course of action. What we really have are problem solving processes nested within problem solving processes. For expository purposes, it is easier to speak of the three principal phases discussed above that become clearly discernible as the problem solving process unfolds.

Tactical

Few would dispute the fact that a leader's tactical skills are a primary determinant of a unit's performance in a tactical situation. However, except for the studies by Uhlaner (1970, 1975) and Helme, Wellemin, and Grafton (1971), the leadership research literature is not very helpful with respect to tactical skills. Although there is very little in the research literature that addresses tactics specifically for small units, various field manuals set forth the basic concepts of U. S. Army doctrine. For example, FM 21-6 How to Prepare and Conduct Military Training (1975) states that:

> "The tactics and the techniques used to accomplish the squad's missions are not fixed. As the enemy situation, terrain, and other environmental factors change, the squad must adapt to these changes. It must reach into its bag of tricks (the tactics and techniques it uses) and find the right combination which will permit it to accomplish its mission without sustaining excessive casualties" (p. 51).

Although the quotation was written with rifle squads in mind, the thought or concept it conveys is applicable to all branches of the combat arms and to all units from infantry fire teams or armor sections to mechanized infantry or armor companies. Furthermore, FM 21-6 states that leaders are responsible for preparing and conducting effective tactical collective training. This statement can be interpreted to mean that a leader must have tactical skills. Many other FMs, too numerous to list here, also discuss various aspects of tactics and further support its inclusion as a leader skill.

Tactics, most will agree, involve both knowledge and application. Before anything else, a leader must have tactical knowledge, a foundation of what the acceptable tactics are. However, knowledge cannot be considered a skill. For the present effort, it is assumed that tactical knowledge is present. It is the application of that knowledge that constitutes the leader skill. Application may involve combining portions of acceptable tactics, developing new tactics, or varying existing tactics.

Application. Regardless of a unit's mission (e.g., defense, movement to contact, delay, retrograde), every unit is expected to accomplish three major goals: detection of the enemy, destruction of the enemy, and sustaining minimal casualties (*FM 71-1 The Tank and Mechanized Infantry Company Team*, 1977). One possible exception would be a reconnaissance mission that would not normally include destroying the enemy. In October 1966, a battalion of the 25th Infantry Division was conducting a search and destroy mission in the HoBo Woods in Tay Ninh Province of South Vietnam. An infantry platoon was being used as the battalion point element. Moving cautiously in heavily wooded terrain, the platoon suddenly came under heavy and light machine gun fire. The platoon had walked into a "V" shaped complex of reinforced concrete bunkers manned by heavy and light machine gun crews. The platoon leader had failed to detect the enemy. The consequences--100% casualties including 11 killed. The above incident took place in Operation Attleboro and is documented by Marshall (1969). Another example is an incident that occurred during ES exercises conducted at Fort Hunter-Liggett in September 1978. During a movement to contact, a combined arms team consisting of an armor and mechanized infantry platoon and a TOW section was moving forward in a valley. The infantry platoon was leading the team. Suddenly, a defense sagger engaged the infantry platoon. Within seconds, the infantry platoon had lost all personnel and four APCs. Again, the infantry platoon leader had not detected the enemy, and the consequences were catastrophic. If the leaders of these units had demonstrated better proficiency in the tactical skills associated with detecting the enemy, casualties might well have been minimized. In both instances, overwatch techniques could have been used for the purpose of detecting the enemy.

Once the enemy has been detected, one must possess the tactical skills required to suppress and destroy the enemy. There exists an overlap between these skills and the technical skills associated with weapons. The primary difference between the two is that the technical skills associated with weapons primarily concern the matching of weapons with potential targets (i.e., placing an anti-armor weapon as opposed to light arms where an enemy tank is likely to appear), whereas the tactical skills associated with destroying the enemy concern rendering the enemy force an ineffective element.

As was the case with tactical skills associated with detecting the enemy, historical incidents illustrate the importance and justify the inclusion of the tactical skills associated with destroying the enemy. During ES exercises conducted in Wildflicken, West Germany (1974), infantry elements were employed in small patrols well in front (500-1,000 meters) of advancing tanks. The infantry units were directed to locate anti-tank elements and register indirect fire on them. They succeeded in this mission. Had they detected the anti-tank elements and not been able to destroy them with indirect fire, they themselves, as well as the advancing tank force, could have received heavy casualties. Another incident (Hannaman, 1967), which illustrates the importance of this skill, occurred in June 1967 outside the village of Trang Bang, Tay Ninh Province in South Vietnam. A squad from the reconnaissance platoon of the 1/27 infantry had established an ambush on a trail frequently used by the 271st Regiment of the NVA. A NVA platoon was sighted coming down the trail before daybreak. The reconnaissance platoon had detected the enemy without itself being detected. However, the ambush was triggered prematurely by an impatient M60 gunner in a flank position. As a result, the NVA platoon was engaged before the entire element was within the kill zone of the ambush. The unit and its leader demonstrated their proficiency in detecting the enemy, but were not effective at destroying the enemy. The NVA platoon sustained only one casualty before withdrawing into the jungle. Had the ambush not been triggered prematurely, the NVA platoon might have been effectively destroyed.

A leader must be proficient in the tactical skills associated with minimizing casualties as well as detection and destruction of the enemy. If the leader and his unit are proficient in the detection and destruction of the enemy but sustain a large percentage of casualties, their overall tactical skill leaves much to be desired. Specifically, minimizing casualties involves remaining an effective fighting force after engaging the enemy. Proficiency in this skill involves minimizing the probability of being detected prior to an engagement and sustaining minimum casualties during an engagement. A well-documented incident that underscores the importance of minimizing casualties occurred in April 1953 in Korea during the fight for Pork Chop Hill (Marshall, 1956). Two rifle companies were committed to making an assault up Pork Chop Hill in order to recapture it from the Chinese. In brief, both units suffered heavy casualties which rendered them ineffective fighting units. The division commander had to reinforce them with two other rifle companies. In another incident a platoon was employed as a reactionary force to relieve a U. S. platoon pinned down by the NVA (Hannaman, 1967). The reactionary force was landed via helicopters behind the NVA platoon. They detected the NVA platoon without being detected themselves and inflicted 100% casualties on the NVA force. However, they failed to suppress the NVA force with artillery or close air support and allowed the NVA to inflict approximately 85% casualties. In this example, the unit accomplished its mission; however, it sustained heavy casualties that rendered it an ineffective fighting force. Little proficiency was demonstrated in the tactical skills associated with sustaining minimal casualties.

In brief, it should be understood that the tactical skills associated with detecting and destroying the enemy and sustaining minimal casualties are not isolated from one another. To possess a high degree of proficiency in the application of tactics, proficiency must be demonstrated in all three areas. The absence of any one of the three tactical application skills diminishes the effectiveness of the others.

Technical

Both Uhlaner (1975) and Williams (1956) cite technical skills as an important factor in their respective leadership studies. In these studies, however, technical skills are treated on a very general level. According to Uhlaner (1975) in his description of technical staff skills, "a major aspect of technical/managerial performance involves use of specific knowledge and skills in logistics and technical services in support of combat activities" (p. 11). The critical incident study by Williams (1956) reported in Campbell, et al. (1970) includes the following descriptions under the heading of technical competence: "effectively organizes and applies knowledge of management to his job," "utilizes all available sources of information in reaching conclusions or decisions," and "demonstrates ingenuity in solving management problems." Both Uhlaner and Williams seem to be addressing the managerial side of technical resources rather than identifying the specific technical skills and knowledges required in a tactical setting.

At the more specific level, there are numerous DA publications (FMs, TMs, TCs) that address a multitude of technical skills (e.g., camouflage, explosives and demolition, field radio techniques). These publications are directed to both enlisted and officer personnel and can be found referenced in ARTEP 71-2 (1977).

In an effort to avoid the extremes of being too general or too specific, we have divided technical skills into the effective use of equipment and proficiency on a number of basic skills. The components of technical equipment skills include the effective use of tactical vehicles, communication equipment, and weapons. The components of basic technical skills include map reading and terrain analysis. Each of the components will be addressed individually.

Equipment. Proficiency in the use of tactical vehicles includes understanding of when and how to use them. This is evident from many observations of combined arms tactical ES exercises that involved extensive use of both Armored Personnel Carriers (APCs) and tanks. During such exercises conducted at Fort Hunter-Liggett in September 1978, company teams moved tanks as a unit but did not employ overwatch. As a result, many tanks were lost to enemy fire and enemy positions were not detected. Had proper overwatch been employed, enemy positions probably could have been detected by overwatch elements.

Technically, communication equipment could be viewed to include the Army's entire array of electronic communication equipment. However, for the purpose of this discussion, only communication equipment typical of small units is of concern, including platoon, squad, field radios, and telephones. It is important that all available means of conventional or electronic communication equipment be used in tactical situations. This increases communication within the unit and the probability of succeeding in a tactical situation. During ES exercises conducted in Berlin (1975), an infantry platoon leader in the defense placed an observation post (OP) 500 meters in front of his main defensive line. The terrain was heavily wooded, which prevented any visual contact with the OP, and the distance was too great to communicate verbally without a radio or telephone. However, the platoon leader did not provide the OP with a radio or field telephone although equipment was available. As a result, when the OP detected the enemy, he had no means of informing the platoon leader. The OP was killed, and the only intelligence received by the platoon leader was the small arms fire. In another example (Hannaman, 1966), the leader of a reconnaissance platoon on a search and destroy mission had insured that all three squads in his platoon were equipped with PRC-77 radios since it was impossible to maintain visual contact with all squads involved. The squad serving as the point element for the platoon was ambushed, and though there were few casualties, the NVA did capture a PRC-77. The platoon leader began communication with the two remaining squads using his PRC-77 in order to coordinate an offensive tactic, but the platoon net was immediately keyed by the NVA force. Because the platoon leader had failed to tell his squad leaders the alternate frequency, all communications ceased. The platoon leader had to physically locate the squad leaders to give them the alternate frequency. To make matters worse, the platoon leader picked an arbitrary alternate frequency, initiated a communication check, and was abruptly told that the net he had selected was the command net of a sister battalion. By the time the communication problems were solved the NVA unit had disappeared. Both of the cases cited above serve to justify and support proficiency in the use of communication equipment as a leader skill.

Proficiency in the use of weapons is the third technical equipment skill. In this context, weapons include only those organic to small units and any weapons normally used to support small units. These are the following:

small arms (M16 and M60)
anti-armor weapons (TOW, DRAGON, M72 LAW, and 90mm Recoilless Rifle)
anti-tank and anti-personnel mines
indirect fire (105mm, 155mm, 81mm mortar, 4.2 mortar)
tank main gun
grenades

Proficiency in the use of weapons can be discussed in terms of three aspects: 1) matching weapons with potential targets, 2) selecting the appropriate weapon for engaging an enemy when several weapons are available, and 3) effectively deploying weapons in a manner that permits their use to complement one another.

Matching weapons and targets involves placing anti-armor weapons where armor targets are anticipated and small arms where human targets are anticipated. For example, if a leader anticipated tanks would use a dirt road within his area of operation, and he wanted to position a weapon that could destroy approaching targets (tanks) near the road, he should not place an infantryman with an M16 at that location. An anti-armor weapon would, of course, be more appropriate.

When several weapons are available, a leader must be proficient at selecting the most appropriate weapon with which to engage the enemy. The first concern is whether the available weapon can destroy or delay the target. For example, if an infantryman, armed with grenades and an M16, suddenly saw an advancing tank, he has a choice of two weapons with which he could engage the tank. However, in this instance, neither weapon would be effective against the target. The second concern is to select the appropriate weapon when more than one exists that could destroy the target. When a choice is available, it is wise to engage the enemy with the weapon that is least likely to give away one's position.

The third aspect involved with the effective use of weapons is effectively employing weapons in a manner that permits their use to complement one another. During ES exercises conducted at Fort Pickett (1978) several incidents occurred that illustrate this point. The defense had placed an M60 in a woodline on the opposite side of a clearing where offensive elements were expected to advance. A preplanned, indirect fire mission had been requested directly on the opposite side of the clearing. When the point man for the advancing offense attempted to cross the open area, the M60 began to fire on full automatic. The offense bunched up and remained stationary in the opposite woodline. The M60 position, equipped with a PRC-77, then requested the preplanned, indirect fire mission which inflicted more than 40% casualties on the offense. The combination of the direct and indirect fire complemented one another and appeared to be a viable tactic.

Basic. There are many basic skills that could have been included in this skill category. Only those that significantly contribute to the outcome of a tactical situation and occur frequently have been selected. First aid, chemical warfare, rappelling, and mountaineering are examples of basic skills that may contribute to the outcome of a tactical situation, but not to a significant degree. We have selected proficiency in map reading and terrain analysis.

Map reading is the ability to identify the location of objectives or personnel on a map. During ES exercises conducted at Fort Stewart in 1976 with the 1/75th Ranger Battalion, several incidents occurred that illustrate the importance of this skill. In an operation order (OPORD) received by a platoon leader, the coordinates of the linear defense the platoon leader was to attack were given. The battle might have been short-lived if the platoon leader had requested an indirect fire mission prior to crossing his line of departure. Instead, the platoon leader decided to move forward and not to request indirect fire until his platoon was within 100 meters of the objective. As he moved forward, his point element was engaged by small arms from the linear defense. The leader halted his platoon, and referred to his map to verify the coordinates of the defense he was given prior to the exercise. He concluded that the coordinates he was given were inaccurate, changed them, and requested indirect fire at the coordinates he concluded were correct. His fire mission impacted behind the defense's positions. The delay that resulted from having to adjust from the first indirect fire mission apparently contributed to the platoon remaining in a stationary posture. The defense was able to accurately pinpoint their position and requested a fire for effect on the element. The platoon and its leader were killed.

Terrain analysis parallels map reading but does not include pinpointing locations. Terrain analysis in this context means interpreting topography (either from a map or by actually viewing the terrain) for the purpose of planning actions and anticipating enemy actions or positions. Analyzing the terrain for the purpose of deciding where to place defensive positions, where enemy tanks are likely to advance, and selecting a route of advance offering cover and concealment are examples of terrain analysis skills. The following combat experience of Jones (1968) illustrates the importance of terrain analysis.

In 1968 in Quang Tri Province, Vietnam, a reconnaissance team was inserted just below the demilitarized zone. The reconnaissance team's area of operation (AO) was suspected to contain enemy forces. The size and exact location of the enemy force was unknown. Once on the ground the reconnaissance team leader began to analyze the terrain to reassess his earlier thoughts on possible locations of the enemy within his AO. The reconnaissance leader had initially thought that a large hill with protruding fingers at the northern end of the AO provided excellent observations of the surrounding area and would be an ideal location for directing artillery and rocket fire against American forces. The proximity of the hill to the DMZ (500 meters below) provided for a perfect route of withdrawal. From his terrain analysis, the reconnaissance team leader decided to run several fire missions on the hill and to monitor it closely for indications of enemy activity. A number of events proved the reconnaissance team leader's terrain analysis to be correct. The fire missions resulted in secondary explosions and the exposure of enemy ammunition storage trenches and bunkers. A sizeable enemy force occupied the hill. Even after artillery barrages and air strikes, the enemy was still able to repel an attempt by a Marine company to seize the hill. Had the team leader not done a good terrain analysis, the reconnaissance patrol could have decided to use the hill for its own observational purposes. If the team had gone up the hill it probably would have been surrounded and wiped out by the NVA forces already in position there.

Measurement Procedures and Limited Scale Investigation

Further subtasks of Section I called for (a) the development of candidate procedures for measuring the identified skills and processes and (b) a limited scale investigations of leader skills and processes which utilize the measurement procedures. During September 1978, two members of the research staff had the opportunity to attend Training Instrumentation Evaluation (TIE) exercises at Hunter-Liggett military reservation. A limited number of participants were administered the Leader Observation Checklist (Appendix C) and the Subordinate Questionnaire (Appendix D). These instruments were developed from the Leader Skill Categories and Individual Skills Matrix (Appendix B) and were used as rudimentary measures to assess the presence or absence of the identified leader skills and processes. The Leader Observation Checklist contains a list of 95 behaviors and actions that leaders usually manifest while giving an OPORD or during the actual exercise. Research staff were assigned to leaders during a given exercise and made their observations on the basis of the checklist. The value of the Leader Observation Checklist in terms of research and development was that it provided a systematic basis for assessing how well the identified skills and processes matched or agreed with actual leader behaviors occurring in a tactical setting. The Subordinate Questionnaire provided similar information. It was given to subordinates after the exercise and required the presence or absence of listed leader skills to be indicated accordingly. The original version of the Subordinate Questionnaire also consisted of 95 items but its length was considered to be impractical for administering under field conditions and thus it was reduced by half and appears in odd/even forms (Appendix D). The reduced forms took participants an average of 20 minutes to fill out. Because of the limited nature and opportunity for data collection at Hunter-Liggett, no attempt is made here to portray data or make generalizations concerning leader behavior. From the data collection with the Leader Observation Checklist and Subordinate Questionnaire, it was possible, however, to pinpoint flaws and redundancies in the existing set of leader skills and group interactive processes.

Another type of measurement procedure was developed which is perhaps more appropriate for skills such as problem solving that are difficult to operationalize. A wealth of accurate historical data from previous ES exercises collected by ARI provided the necessary case material for the development of this procedure. With this information, it was possible to take the salient events that leaders encounter in an actual exercise and incorporate them into a measurement module that would expose other leaders without this experience to similar skill demands. A prototype of the measurement technique has been developed for individual skills associated with the leader skill category of problem solving. This prototype module represents an abstraction from an ES exercise where the leader's objective is to locate the enemy forces on a topographical map. The information for the leader's problem solving decisions about enemy locations are messages transmitted between leaders during an ES exercise. To be effective, every effort was made to keep the experiential quality of the simulated performance intact.

The concept behind this measurement technique or module is to confront the company team and platoon leaders with problem solving demands similar to those found in ES or combat. Problem solving in this context refers to the process by which a leader continually anticipates enemy disposition and intention. Each enemy action is analyzed to ascertain the opposition's overall scheme of maneuver and deployment. A leader's ability to anticipate enemy deployment before and during an exercise bears directly on the development of effective fire support plans, overwatch positions, and routes of movement. For example, poor enemy anticipation could result in fire support plans that would not adequately suppress enemy weapons systems and would therefore contribute to first round hits.

The measurement module is an audio-visual presentation constructed from historical data obtained in an ES exercise. First, the leaders are shown an enlarged topographical map on a screen and are provided with specific information about their mission and the enemy situation. (The mission is the same as one that was given to a Team Commander in an actual ES exercise.) Based on this information, the leaders are asked to make initial determinations about the enemy's probable deployment. Answers are written on answer sheets provided. Leaders are shown a series of slides and then listen to accompanying audio cues (radio transmissions) that describe a developing situation; that is, contact with an enemy force that is characterized by a progressive increase in engagement intensity. After seeing each slide and listening to the appropriate audio cues, each leader is asked to reassess the situation and to indicate probable enemy deployment by a specific type of element or weapons system. A time limit for completing this task is placed on the leaders so as to simulate the time constraints and pressure a leader experiences in an actual exercise.

The content for each slide is an action that took place during an ES exercise. The slides are presented in the same sequence as the actions actually occurred. The actions are visually presented by graphic symbols on an enlarged map showing team deployment, enemy sightings, and contact as indicated to the team commander by various elements of his maneuver force. The audio portion is taken from the actual two-way radio transmissions between the elements and the team commander.

A simulated audio-visual technique of measurements has a number of possible advantages.

- It has potential use as a diagnostic tool to assess a leader's ability to exercise problem-solving skills.
- After the initial presentation, it can be re-run to provide a detailed analysis of each action. Certain enemy intentions might be identified by cues within a certain action.
- Several tactical experiences can be incorporated within a problem solving module. This would provide a leader, in a short period of time, with several problem solving experiences.
- The opportunity for a leader to practice and focus on one skill, without having to address the complexities of an ES exercise, may be a way to help maximize the learning of a particular skill.
- Since the measurement technique is based on actual occurrences in an ES exercise the technique helps to insure good content validity.

Further refinement of this low-cost technique, and adapting it to other skills, are indeed worthy pursuits for future research.

Yet another type of candidate measurement procedure that was given serious consideration was an analytic procedure whereby one proceeds from diagnosis of the outcome to causes. Diagnosis from outcome to causes represents a way to partial out the contributions of various skills to the overall outcome. Even the outcomes of equipment-related skills such as hitting a target are joint products of several contributing factors (e.g., breath control, trigger squeeze, and sight picture). As one moves along the continuum of skills from those which are machine dependent to those which are machine non-dependent (such as problem solving where the repertoire of possible actions increases considerably), there appears to be an even greater need for an analysis from outcome back to contributing factors. Under such circumstances, outcomes are likely to depend on a wider range of contributing factors. The working backward analysis from outcome will always be imperfect in that one might trace back to the wrong contributing factor(s), but such an approach is far better than guesses that are made without the benefit of analysis. The analytic procedure requires a certain degree of judgement on the part of the observer and thus may not be as objective as the go/no-go criterion checklist type of measurement. But the go/no-go criterion scheme of measurement does not allow one to causally relate unit performance or outcomes back to leader skills whereas the analytic procedure does. It is quite possible that the checks that a leader receives in the go or no-go column of a checklist have no bearing whatsoever on unit outcomes. The problem is that one has no way of knowing. Instead, with the analytic approach, one is making an explicit attempt (albeit more subject to individual bias) to determine if a leader's actions and decisions were appropriate for the conditions that developed and whether the consequences of these actions can be linked to unit performance and outcomes.

The lesson to be learned from the above discussion is that any attempt to develop candidate procedures for measuring leader skills and group-interactive processes should not be restricted to a singular approach. The sheer complexity of the ES environment and early developmental status of ES research argues against focusing on one approach to the exclusion of others. Each of the measurement procedures discussed in this paper has its unique strengths and weaknesses and thus may be appropriate for some skills and not others. It is only through continued research that the boundary conditions of the different measurement procedures can be determined.

Summary. The purpose of the research effort so far has been to determine what leader skills and leader-group interactive processes have the potential to influence unit performance in tactical situations. We started with a global and historical review of the leadership research literature and then focused more selectively on leader skills and processes as they occur in tactical settings.

It was observed that much of the leadership research and theory stems from industrial, managerial, or academic settings. The literature review was useful for acquiring an understanding of the state-of-the art. Of the leadership models reviewed, the problem solving approach, we feel, is the most relevant for addressing the skills and demands placed upon leaders in tactical settings. The research on communication is also considered quite relevant. Both of these areas of research aided in the delineation of the leader skill categories and were especially useful in guiding our thinking in the subsequent development of the candidate measurement procedures. The areas of research involving initiation of structure and interaction with superiors and subordinates were also useful in the creation of skill categories. Staff experience and ES data (e.g., battle narratives, audio tapes, and net control sheets) collected at Fort Pickett and other locations were used to confirm leadership skills and processes identified in the literature and for establishing other skill categories. Once these leader categories were identified, it was possible to develop candidate procedures for measuring them in the context of a limited scale investigation.

REFERENCES

Adamson, R. E. Functional Fixedness as related to problem-solving. Journal of Experimental Psychology, 1952, 44, 288-291.

Anderson, R. C. Can first graders learn an advanced problem-solving skill? Journal of Educational Psychology, 1965, 56, 283-294.

Argyris, C. Increasing leadership effectiveness. New York: Wiley-Interscience, 1976. (a)

Argyris, C. Leadership, learning, and changing the status quo. Organizational Dynamics, 1976, 4 (3), 29-43. (b)

Argyris, C. Theories of action that inhibit individual learning. American Psychologist, 1976, 31, 638-654. (c)

ARTEP 71-2 Army training and evaluation program for mechanized infantry/tank task force. Washington, D. C.: Department of the Army, June 1977.

Bales, R. F. Interaction process analysis. Reading, Mass.: Addison-Wesley, 1950.

Bass, B. M., Klubeck, S., and Wurster, C. R. Factors influencing the reliability and validity of leaderless group discussion assessment. Journal of Applied Psychology, 1953, 37, 26-30.

Bavelas, A. Leadership: Man and function. Administrative Science Quarterly, 1960, 4, 491-498.

Berlo, D. A question of style. The Personnel Administrator, 1974, 37, 16-20.

Bingham, W. Leadership. In H. C. Metcalf (Ed.), The psychological foundations of management. New York: Shaw, 1927.

Blake, R. R., and Mouton, J. S. The managerial grid. Houston: Gulf, 1964.

Blake, R. R., Mouton, J. S., and Fruchter, B. The consistency of interpersonal behavior judgments made on the basis of short-term interactions in three-man groups. Journal of Abnormal and Social Psychology, 1954, 49, 573-578.

Borg, W. R., and Tupes, E. C. Personality characteristics related to leadership behavior in two types of small group situational problems. Journal of Applied Psychology, 1958, 42, 252-256.

Borgatta, E. F. Analysis of social interaction and socimetric perception. Sociometry, 1954, 17, 7-32.

Brown, A. F. Reactions to leadership. Educational Administrative Quarterly, 1967, 3, 62-73.

Calder, B. J. An attribution theory of leadership. In B. Staw and G. Salancik (Eds.), New directions in organizational behavior. Chicago: St. Clair Press, 1976.

Campbell, J. P., and Dunnette, M. D. Effectiveness of T-group experiences in managerial training and development. Psychological Bulletin, 1968, 70, 73-104.

Campbell, J. P., Dunnette, M. D., Lawler, E. E. III, and Weick, K.D. Managerial behavior, performance, and effectiveness. New York: McGraw-Hill, 1970.

Carlyle, Thomas. Lectures on heroes, hero-worship and the heroic in history. P. C. Parr (Ed.), The Clarendon Press, Oxford, 1910.

Carter, L. F., and Nixon, M. An investigation of the relationship between four criteria of leadership ability for three different tasks. Journal of Psychology, 1949, 27, 245-261.

Carter, L. F., Haythorn, W., Shriver, B., and Lanzetta, J. T. The behavior of leaders and other group members. Journal of Abnormal and Social Psychology, 1951, 46, 589-595.

Cartwright, D., and Zander, A. Group dynamics: Research and theory (2nd ed.). Evanston, Illinois: Row, Peterson and Co., 1960.

Clark, R. A. Leadership in rifle squads on the Korean front line. George Washington University, Human Resources Research Office, Technical Report 21, 1955.

Coch, L., and French, J. R. P., Jr. Overcoming resistance to change. Human Relations, 1948, 1, 512-532.

Cohen, J. A preliminary study of the effect of delayed recording on the quality of thought. In G. Revesz (Ed.), Thinking and speaking: a symposium. Acta Psychologica, 1954, 10, 111-124.

Cummings, L. L. Comments on Graen and Cashman's paper. In J. G. Hunt and L. L. Larson (Eds.), *Leadership Frontiers*. Kent: Kent State University Press, 1975.

Dansereau, F. G., Graen, G., and Haga, W. J. A vertical dyad linkage approach to leadership within formal organizations. *Organizational Behavior and Human Performance*, 1975, *13*, 46-78.

Dawson, J. E. Consideration and ICS: instructor leadership influencing student performance. Easts Lansing: Michigan State University, Human Learning Research Institute, 1970.

Dees, J. Squad performance as a function of the distribution of a squad radio. HumRRO Technical Report 69-24, December 1969.

Dessler, G. and House, R. J. A test of a path-goal motivation theory of leadership. *Academy of Management Proceedings*, 1972, 178-81.

Dixon, N. F. *On the psychology of military incompetence*. New York: Basic Books, 1976.

Dowd, J. *Control in human societies*. New York: Appleton-Century, 1936.

Driver, M. J. and Streufert, S. Integrative complexity: An approach to individuals and groups as conformation processing systems. *Administrative Science Quarterly*, 1969, *14*, 272-285.

Duncan, C. P. Effect of instructions and information on problem-solving. *Journal of Experimental Psychology*, 1963, *65*, 321-327.

Duncker, K. On problem-solving (Translated by L. S. Lees). *Psychologial Monographs*, 1945, *58*, No. 270.

Fiedler, F. E. *A theory of leadership effectiveness*. New York: McGraw-Hill, 1967.

Fiedler, F. E., Bass, A. R., and Fiedler, J. M. The leader's perception of coworkers, group climate, and group creativity: A cross validation. In F. E. Fiedler (Ed.), *A Theory of Leadership Effectiveness*. New York: McGraw-Hill, 1967.

Fiedler, F. E. and Chemers, M. M. *Leadership and effective management*. Glenview, Illinois: Scott, Foresman, 1974.

Filley, A. L. and House, R. J. *Managerial process and organizational behavior*. Glenview, Illinois: Scott, Foresman, 1969.

Flanagan, J. C. The critical incident technique. *Psychological Bulletin*, 1954, *51*, 327-358.

Fleishman, E. A. Attitude versus skill factors in work group productivity. *Personnel Psychology*, 1965, *18*, 253-266.

Fleishman, E. A. Twenty years of consideration and structure. In E. A. Fleishman and J. G. Hunt (Eds.), *Current developments in the study of leadership*. Carbondale: Southern Illinois University Press, 1973.

Fleishman, E. A., and Harris, E. F. Patterns of leadership behavior related to employee grievances and turnover. *Personnel Psychology*, 1962, *15*, 43-56.

FM 21-6 *How to prepare and conduct military training*. Washington, D. C.: Department of the Army, November 1975.

FM 71-1 *The tank and mechanized infantry company team*. Washington, D.C.: Department of the Army, June 1977.

FM 100-12 *Staff officers' field manual--staff operations and procedures*. Washington, D.C.: Department of the Army, June 1977.

Foa, U. G., Mitchell, T. R., and Fiedler, F. E. Differentiating matching. *Behavioral Science*, 1971, *16*, 130-142.

French, J. R. P., Jr. Israel, J., and As, D. An experiment on participation in a Norwegian factory. *Human Relations*, 1960, *13*, 3-19.

Gagne, R. M. Problem-solving. In A. W. Melton (Ed.), *Categories of human learning*. New York: Academic Press, 1964.

Galton, (Sir) Francis. *Hereditary genius*. Macmillan and Company, London, 1879.

Garland, A. N. *Infantry in Vietnam.* Fort Benning, Georgia: Infantry Magazine, 1967.

George, C. E. Training for coordination within rifle squads. In T. O. Jacobs (Chair), U. S. Army Human Factors Research and Development Symposium Individual and Small-Unit Training for Combat Operations (Professional Paper 21-67). Presented at the 12th Annual Army Human Factors Research and Development Conference (Fort Benning, Ga., 1966). Alexandria, Va. Human Resources Research Organization, May 1967.

Gibb, C. A. The principles and traits of leadership. Journal of Abnormal and Social Psychology, 1947, 42, 267-284.

Gouldner, A. W. Studies in leadership. New York: Harper, 1950.

Graen, G. Role-making processes within complex organizations. In M. D. Dunnette (Ed.), Handbook of Industrial and Organizational Psychology, Chicago: Rand McNally, 1975.

Graen, G., Alvares, K., Orris, J. B., and Martella, J. A. Contingency model of leadership effectiveness: Antecedent and evidential results. Psychological Bulletin, 1970, 74, 285-96.

Graen, G., Orris, J. B., and Alvares, K. M. Contingency model of leadership effectiveness: Some methodological issues. Journal of Applied Psycholcgy, 1971, 55, 205-10.

Graen, G. and Cashman, J. F. A role-making model of leadership in formal organizations: A developmental approach. In J. G. Hunt and L. L. Larson (Eds.), Leadership Frontiers, Kent: Kent State University Press, 1975.

Greenfield, T. B. Research on the behavior of educational leaders: Critique of a tradition. Alberta Journal of Educational Research, 1968, 14 (1), 55-76.

Halpin, A. W. The leadership behavior and combat performance of airplane commanders. Journal of Abnormal and Social Psychology, 1954, 49, 19-22.

Halpin, A. W., and Winer, B. J. A factorial study of the leader behavior descriptions. In R. M. Stogdill and A. E. Coons (Eds.), Leader behavior: Its description and measurement. Columbus: Ohio State University, Bureau of Business Research, 1957.

Hannaman, D. L. Personal experience in Vietnam, 1966-1967.

Havron, M. D., Fay, R. J., and Goodacre, D. M. Research on the effectiveness of small military units. Institute for Research in Human Relations, April 1951.

Havron, D. M., Lybrand, W. A., and Cohen, E. The assessment of infantry rifle squad effectiveness. PRB Technical Research Report 1087, December 1954. (a)

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Havron, M. D., Lybrand, W. A., and Cohen, E. The assessment and prediction of rifle squad effectiveness. PRB Technical Research Note 31, November 1954. (b)

Havron, M. D., Lybrand, W. A., and Cohen, E. The field problems, rating forms and manuals. Appendix I to PRB Technical Research Note 31, November 1954. (c)

Havron, M. D., Lybrand, W. A. and Cohen, E. The predictor instruments. Appendix II to PRB Technical Research Note 31, November 1954. (d)

Heller, F. A. Managerial decision-making: A study of leadership styles and power-sharing among senior managers. London: Tavistock, 1971.

Helme, W. H., Willemin, L. P., and Grafton, F. C. Dimensions of leadership in a simulated combat situation. Behavior and Systems Research Laboratory, Technical Research Report 1172, July 1971.

Hemphill, J. K. The leader and his group. Educational Research Bulletin, 1949, 28, 225-229, 245-246. (a)

Hemphill, J. K. Situational factors in leadership. Columbus: Ohio State University, Bureau of Educational Research, 1949. (b)

Hemphill, J. K. Relations between the size of the group and the behavior of superior leaders. Journal of Abnormal and Social Psychology, 1950, 32, 11-12.

Hemphill, J. K. A proposed theory of leadership in small groups. Columbus: Ohio State University, Personnel Research Board, Technical Report, 1954.

Hemphill, J. K. Leader behavior description. Columbus: Ohio State University, Personnel Research Board, 1950.

Hemphill, J. K., and Coons, A. E. Development of the leader behavior description questionnaire. In R. M. Stogdill and A. E. Coons (Eds.), Leader behavior: Its description and measurement. Columbus: Ohio State University, Bureau of Business Research, 1957.

Hemphill, J. K., Pepinsky, P. N., Shevitz, R. N., Jaynes, W. E., and Christner, C. A. The relation between possession of task-relevant information and attempts to lead. Psychological Monographs, 1956, No. 414.

Heslin, R., and Dunphy, D. Three dimensions of member satisfaction in small groups. Human Relations, 1964, 17, 99-112.

Hollander, E. P. Principles and methods of social psychology. New York: Oxford University Press, 1967.

Hollander, E. P., and Julian, J. W. Contemporary trends in the analysis of leadership processes. Psychological Bulletin, 1969, 71, 387-397.

House, R. J. T-group education and leadership effectiveness: A review of empiric literature and a critical evaluation. Personnel Psychology, 1967, 20, 1-32.

House, R. J. A path-goal theory of leader effectiveness. In E. A. Fleishman and J. G. Hunt (Eds.), Current Development in the Study of Leadership. Carbondale: Southern Illinois University Press, 1973.

House, R. J. and Dessler, G. The path-goal theory of leadership: Some post hoc and a priori tests. In J. G. Hunt and L. L. Larson (Eds.), Contingency Approaches to Leadership. Carbondale: Southern Illinois University Press, 1974.

House, R. J. and Mitchell, T. R. Path-goal theory of leadership. Journal of Contemporary Business, 1974, 3 (4), 81-97.

Howells, L. T., and Becker, S. W. Seating arrangements and leadership emergence. Journal of Abnormal and Social Psychology, 1962, 64, 148-150.

Hutchins, E. B. and Fiedler, F. E. Task-oriented and quasi-therapeutic role functions of the leader in a small military group. Sociometry, 1960, 23, 393-406.

Ilgen, D. R., and Fujii, D. S. An investigation of the validity of leader behavior descriptions obtained from subordinates. Journal of Applied Psychology, 1976, 61, 642-51.

Jacobs, T. O. A program of leadership instruction for junior officers. HumRRO Technical Report 84, June 1963.

Jacobs, T. O. Basic problems in small-unit leadership. (Task Offtrain). U. S. Army Infantry Human Research Unit, 1962.

Jacobs, T. O. Leadership and exchange in formal organizations. Alexandria, Va.: Human Resources Research Organization, 1971.

Jago, A. G., and Vroom, V. H. Perceptions of leadership style: Superior and subordinate descriptions of decision-making behavior. In J. G. Hunt & L. Larson (Eds.), Leadership frontiers. Kent State University Press, 1975.

Jago, A. G., and Vroom, V. H. Predicting leader behavior from a measure of behavioral intent. Technical Report No. 10. New Haven, Conn.: Yale University, 1976.

Johnson, D. M. Systematic introduction to the psychology of thinking. New York: Harper & Row, 1972.

Jones, D. R., Jr. Personal experience in Vietnam, 1968.

Jones, E. E., and Nisbett, R. E. The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valins, and B. Weiner (Eds.), Attribution: Perceiving the causes of behavior. Morristown, N.J.: General Learning Press, 1972.

Kilbourne, C. E. The elements of leadership. Journal of Coast Artillery, 1935, 78, 437-439.

Kipnis, D. M. Interaction between members of bomber crews as a determinant of sociometric choice. Human Relations, 1957, 10, 263-270.

Koffka, K. Principles of gestalt psychology. New York: Harcourt and Brace, 1935.

Kohler, W. The mentality of apes. New York: Harcourt and Brace.

Korman, A. K. "Consideration", "Initiating Structure", and organizational criteria. Personnel Psychology, 1966, 18, 349-360.

Lange, C. J. Campbell, V., Katter, R. V., and Shanley, F. J. A study of leadership in Army infantry platoons. HumRRO Research Report 1, November 1958.

Lange, C. J., and Jacobs, T. O. Leadership in Army infantry platoons: Study II. HumRRO Research Report 5 (Offtrain III), July 1960.

Lange, C. J., Rittenhouse, C. H., and Atkinson, R. C. Films and group discussions as a means of training leaders. HumRRO Technical Report 27, March 1956.

Leavitt, H. J. Some effects of certain communication patterns on group performance. *Journal of Abnormal and Social Psychology*, 1951, *46*, 388-50.

Lippitt, R. An experimental study of the effect of democratic and authoritarian group atmospheres. *University Iowa Study of Child Welfare*, 1940, *16* (3), 43-95.

London, M., and Klimoski, R. J. Self esteem and job complexity as moderators of performance and satisfaction. Paper presented at the 81st Annual Convention, American Psychological Association, Montreal, Canada, 1973.

Luchins, A. S. Classroom experiments on mental set. *American Journal of Psychology*, 1946, *59*, 295-298.

Maier, N. R. F. An aspect of human reasoning. *British Journal of Psychology*, 1933, *24*, 144-155.

Mann, R. D. A review of the relationship between personality and performance in small groups. *Psychological Bulletin*, 1959, *56*, 241-270.

Marrow, A. J., Bowers, D. G., and Seashore, S. E. *Management by by participation*. New York: Harper and Row, 1968.

Marshall, S. L. A. *Pork Chop Hill*. New York: Permabooks, 1956.

Marshall, S. L. A. *Ambush*. New York: Cowles Book Company, Inc., 1969.

Mass, H. A. Personal and group factors in leader's social perception. *Journal of Abnormal and Social Psychology*, 1950, *45*, 54-63.

McCall, M. W., Jr., and Lombardo, M. M. (Eds.), *Leadership: Where else can we go*? Durham, N.C.: Duke University Press, 1977.

McGregor, D. *The human side of enterprise*. New York: McGraw-Hill, 1960.

McMahon, J. T. The contingency theory: Logic and method revisited. *Personnel Psychology*, 1972, *25*, 697-711.

Megargee, E. I., Bogart, P., and Anderson, B. J. The prediction of leadership in a simulated industrial task. *Journal of Applied Psychology*, 1966, *50*, 292-295.

Nisbett, R. E., Caputo, C., Legant, P., and Marecek, J. Behavior as seen by the actor and as seen by the observer. Journal of Personality and Social Psychology, 1973, 27, 154-64.

Osborn, R. N. Discussant comments. In J. G. Hunt and L. L. Larson (Eds.), Contingency Approaches to Leadership. Carbondale: Southern Illinois University Press, 1974.

Osgood, C. E., Suci, G. J., and Tannenbaum, P. H. The measurement of meaning. Urbana: University of Illinois Press, 1957.

Otis, J. L. Psychological requirements analysis of company grade officers. Department of Army, Personnel Research Section, Program 5176, 29 December 1950.

Pfeffer, J. The ambiguity of leadership. In M. W. McCall, Jr. and M. M. Lombardo (Eds.), Leadership: Where else can we go? Durham, N. C.: Duke University Press, 1977.

Ray, W. S. Verbal compared with manipulative solution of an apparatus problem. American Journal of Psychology, 1957, 70, 289-290.

Reid, F. T. Impact of leader style on the functioning of a decision making group. Archives of General Psychiatry, 1970, 23, 268-276.

Rice, R. W. and Chemers, M. M. Predicting the emergence of leaders using Fiedler's contingency model. Journal of Applied Psychology, 1973, 57, 281-287.

Rudraswamy, V. An investigation of the relationship between perceptions of status and leadership attempts. Journal of the Indian Academy of Applied Psychology, 1964, 1, 12-19.

Rush, M. C., Thomas, J. C., and Lord, R. G. Implicit leadership theory: A potential threat to the internal validity of leader behavior questionnaires. Unpublished paper, Department of Psychology, University of Akron, 1976.

Ryan, T. A. Intentional behavior. New York: Ronald Press, 1970.

Schriesheim, C. A., and Kerr, S. Theories and measures of leadership: A critical appraisal of current and future directions. In J. G. Hunt and L. L. Larson (Eds.), Leadership: The cutting edge. Carbondale: Southern Illinois University Press, 1977.

Shaw, M. E. Some effects of varying amounts of information exclusively possessed by a group member upon his behavior in the group. *Journal of General Psaychology*, 1963, *68*, 71-79.

Shaw, M. E. Communication networks. In L. Berkotitz (Ed.), *Advances in experimental social psychology*. New York: Academic Press, 1964.

Shaw, M. E., and Penrod, W. T. Does more information available to a group always improve group performance? *Sociometry*, 1962, *25*, 377-390.

Sheridan, J. E., Downey, H. K., and Slocum, J. W. Testing causal relationships of House's path-goal theory of leadership effectiveness. In J. G. Hunt and L. L. Larson (Eds.), *Leadership Frontiers*. Kent, Ohio: Comparative Administration Research Institute, Kent State University, 1975.

Simon, H. A. *The new science of management decision*. New York: Harper and Row, 1960.

Sommer, R. Leadership and group geography. *Sociometry*, 1961, *24*, 99-110.

Steinzor, B. The spatial factor in face to face discussion groups. *Journal of Abnormal and Social Psychology*, 1950, *45*, 552-555.

Stern, G. Acquisition of problem-solving strategies in young children and its relation to verbalization. *Journal of Educational Psychology*, 1967, *58*, 245-252.

Stogdill, R. M. *Handbook of leadership*. New York: Free Press, 1974.

Stogdill, R. M. Personal factors associated with leadership: A survey of the literature. *Journal of Psychology*. 1948, *25*, 35-71.

Stogdill, R. M., Shartle, C. L., Scott, E. L., Coons, A. E., and Jaynes, W. E. A predictive study of administrative work patterns. Columbus: Ohio State University, Bureau of Business Research, 1956.

Tead, O. The technique of creative leadership. In *Human nature and management.* New York: McGraw-Hill, 1929.

Uhlaner, J. E. Human performance, jobs, and systems psychology--the systems measurement bed. ARI Technical Report S-2, October 1970.

Uhlaner, J. E. Management leadership in system measurement beds. ARI Technical Report S-3, August 1975.

Vroom, V. H. Industrial social psychology. In G. Lindzey and E. Aronson (Eds.), Handbook of social psychology. Reading, Mass.: Addison-Wesley, 1970, 5, 196-268.

Vroom, V. H. Leadership revisited. Technical Report No. 7. New Haven, Conn.: Yale University, 1974.

Vroom, V. H. Leadership. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology. Chicago: Rand McNally, 1976.

Vroom, V. H., and Mann, F. C. Leader authoritarianism and employee attitudes. Personnel Psychology, 1960, 13, 125-140.

Vroom, V. H., and Yetton, P. W. Leadership and decision-making. Pittsburgh, Pa.: University of Pittsburgh Press, 1973.

Watson, P. War on the mind. New York: Basic Books, 1978.

Wertheimer, M. Productive thinking. New York: Harper, 1945.

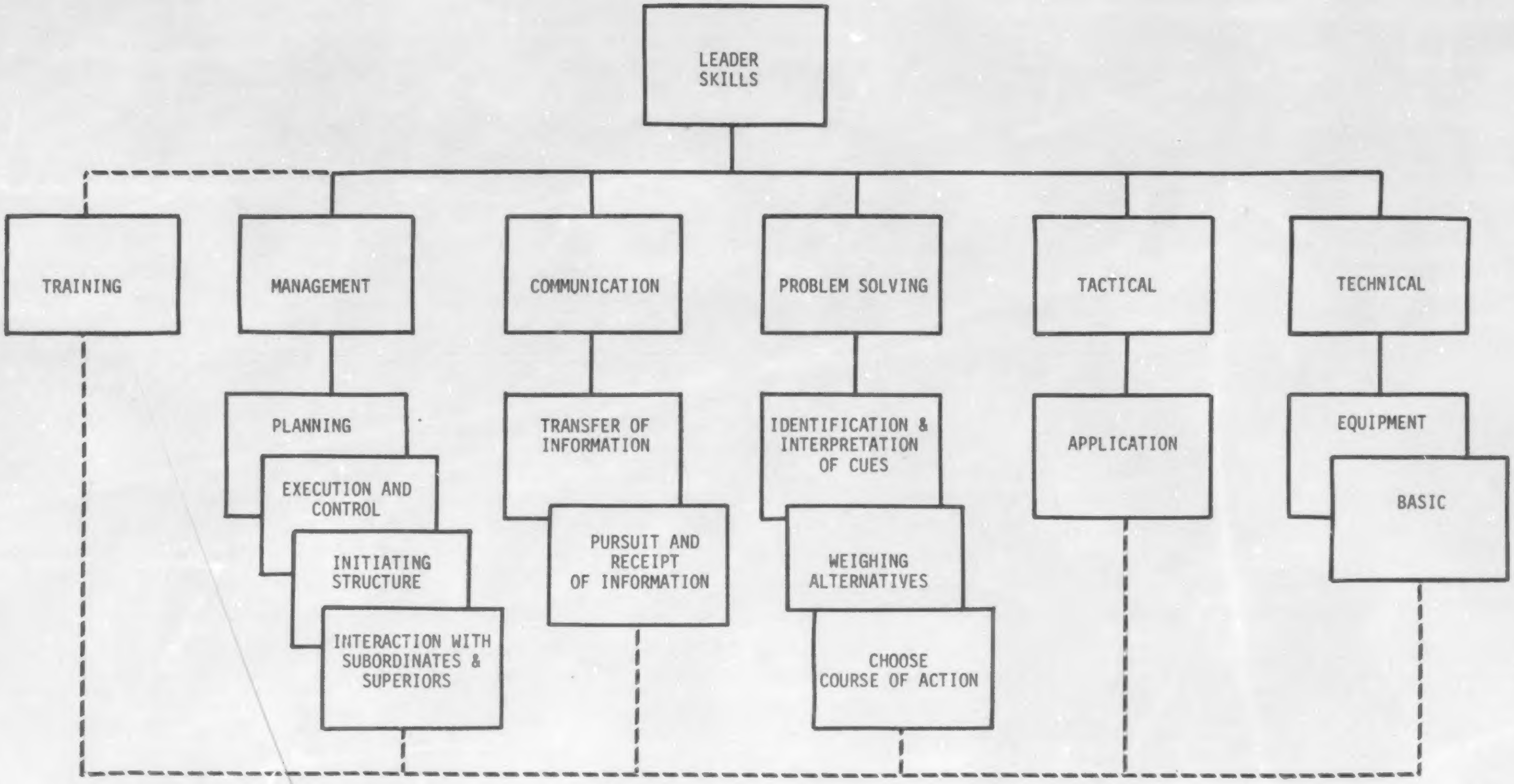
Williams, R. E. A description of some executive abilities by means of the critical incident technique. Unpublished doctoral dissertation, Columbia University, 1956.

Wynne, B. E., and Hunsaker, P. L. A human information-processing approach to the process of leadership. In J. G. Hunt and L. L. Larson (Eds.), Leadership Frontiers. Kent: Kent State University, 1975.

Zdep, S. M., and Oakes, W. F. Reinforcement of leadership behavior in group discussion. Journal of Experimental and Social Psychology, 1967, 3, 310-320.

APPENDIX A LEADER SKILLS BY CATEGORY

LEADER SKILLS BY CATEGORY


LEADER SKILLS
TRAINING
MANAGEMENT
COMMUNICATION
PROBLEM SOLVING
TACTICAL
TECHNICAL
PLANNING
EXECUTION AND CONTROL
INITIATING STRUCTURE
INTERACTION WITH SUBORDINATES & SUPERIORS
TRANSFER OF INFORMATION
PURSUIT AND RECEIPT OF INFORMATION
IDENTIFICATION & INTERPRETATION OF CUES
WEIGHING ALTERNATIVES
CHOOSE COURSE OF ACTION
APPLICATION
EQUIPMENT
BASIC

APPENDIX B LEADER SKILL CATEGORIES AND INDIVIDUAL SKILLS MATRIX

MANAGEMENT: Planning

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
OBJECTIVE	Verbalizes objective in terms of: What is supposed to be done.	X		0												
	Where it is to be done.	X		0												
	At what time it is to be done	X		0												
ENEMY SITUATION	Verbalizes enemy situation in terms of: How many.	X						0								
	Where.	X						0								
	Anticipated action.	X						0								
	Recent enemy activity.	X						0								
	Equipment and weapons.	X						0								
FRIENDLY SITUATION	Verbalizes friendly situation in terms of: Support (artillery, TAC air, gunship)	X														
	Disposition of friendly forces.	X														
CONCEPT	Verbalizes concept of operation in terms of: LD/LC	X														
	AO	X														
	When phases of operation, if any, have been met	X		0												
	Check points and phase lines, if any	X		0												
	Organize element operation	X	0													
EXECUTION	Verbalizes execution in terms of: What participating elements will be doing	X														
	How security of movement will be maintained	X	0													
	Specific requirements for these elements and priorities	X		0												
	Actions to be taken in event of enemy contact	X	0													

MANAGEMENT: Planning

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
EXECUTION (Con't)	Specific measures for controlling participating elements (phase lines, check points, rally points, attack positions)	X	0	0												
	Adjustment of initial plan in event of heavy casualties	X	0													
COMMAND AND SIGNAL	Verbalizes command and signal in terms of: Radio frequencies and call signs	X	0			0							0			
	Chain of command	X	0	0												
	Other signals	X	0													
REHEARSE PLAN	Ask subordinates to readback specific responsibilities	X	0	0	0	0										
	Graphically displays overall operation using visual aids (ground, sticks, rocks).	X				0										
	Ask subordinates to demonstrate, using visual aids, their specific tasks.	X					0									
	Conducts abbreviated rehearsal of planned execution by deploying forces in mock exercise.	X		0												

MANAGEMENT: Execution and Control

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
ON-GOING CONTROL	Maintain continual communication with all elements		X			0	0									
	Contacts subordinates who are not adhering to designated reporting procedures		X	0	0											
	Frequently asks for immediate and complete information from advance elements		X				0									
	Gives immediate direction and/or guidance in response to enemy activity (may first request additional information)		X	0		0										
CONTINGENCY CONTROL	Quickly identifies failures in execution of plan by participating elements and corrects them		X	0												
	Recognizes critical points at which contingency plans should be implemented		X					0								

MANAGEMENT: Initiating Structure

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
DETAILS INSTRUCTIONS	Provides detailed instructions to subordinates regarding subordinates' responsibilities and those of other elements.		0	X		0										
	Breaks mission down into achieveable steps.		0	X		0										
	Explains to subordinates exactly who will replace leaders who become casualties.		0	X												
	Informs subordinates of deadlines (e.g., LD times, times objectives are to be secured)		0	X		0										
	Describes well defined patterns of communication (e.g., SITREPs, "who talks to whom, when, about what, and how)		0	X		0	0									
	Specifies clearly contingency plans including conditions under which contingency plans will be implemented (e.g., loss of communication).		0	X		0										
	Sets definite standards of performance for specific tasks and responsibilities (e.g., specific dimensions of prone positions).		0	X	0											
	Explains rationale for planned actions.			X	0											
FOLLOW-UP CHECKS	Makes periodic checks on progress of group with respect to assigned tasks.		0	X	0											
	Enforces rules of conduct (e.g. informing subordinates of violations/consequences and taking appropriate disciplinary actions).		0	X	0											
	Specific questions are posed by the leader to subordinates concerning their responsibilities and those of their peers (e.g., verbally responds to questions, uses maps, makes ground drawings, etc.)			X			0									

MANAGEMENT: Interaction with Subordinates and Superiors

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
RECOGNIZES SUBORDINATES INPUTS AND ABILITIES	Solicits reactions, opinions, suggestions of subordinates and superiors regarding mission.				X		0									
	Responds to nonverbal cues, gestures of subordinates and superiors regarding their reactions to the plan.				X		0									
	Provides public praise and recognition for work well done (decides appropriateness of public vs. private praise)				X		0									
	Listens attentively to unsolicited suggestions from subordinates.		0		X											
	Delegates responsibility to subordinates.		0		X											
	Allows subordinates to carry out delegated tasks (avoids encroaching on delegated responsibilities and avoid publicly criticizing subordinates).			0	X											
	Recognizes strengths and weaknesses of subordinates and assigns task accordingly.			0	X											
ENFORCES REGULAT ONS AND DISIPLINES	Calmly and firmly interrupts arguments, disagreements and other conflicts among subordinates.				X											
	When confronted with a refusal to carry out an order:															
	Attempts to find out why subordinate is refusing.				X		0									
	Responds to objections by explaining rationale or providing additional support.				X	0										
	If subordinate continues to refuse, remove individual and identify replacement (s).			0	X											

MANAGEMENT: Interaction with Subordinates and Superiors

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
CONCERN FOR PERSONAL WELFARE	Specificially describes to subordinates how they will be backed up in tight situations.		0		X	0										
	Provides specific follow-up instructions in calm, assuring tone to subordinates who are in danger and obviously anxious.		0		X		0									
	Notices possible subordinate injuries and provides for appropriate treatment.				X											
PERSONAL FORTITUDE AND INTEGRITY	Tactfully and firmly provides corrective feedback to subordinates.			0	X	0										
	Firmly states unpopular decisions without apologizing (or blaming higher authority).				X											
	Defends/supports actions of subordinates when criticized by others.				X											
	Honestly admits mistakes to subordinates and superiors.				X											
	Tactfully disagrees with superior's plans and provides possible alternatives.				X	0										
	Sets positive examples for subordinates (e.g., noise discipline, staying awake, not smoking at night, camouflage, etc.).				X	0										
MOTIVATES	Speaking with enthusiastic, confident tone.				X											
	Praising group instead of individuals, if appropriate.				X											
	Identifying importance of specific team elements in achieving group goals.				X	0										
	Provides specific positive praise for particular tasks well done.				X	0										
	Stays active by constantly interacting with subordinates (inquiring about progress of individual tasks/assignments).				X		0									

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COMMUNICATION: Transfer of Information

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
INSURES COMMUNICATION IS UNDERSTOOD BY SUBORDINATES	Asks subordinates for clarifying questions			0	0	X	0									
	Asks subordinate to "read-back" their specific responsibilities in operation.		0			X	0									
	Corrects any misunderstandings based on "read-back."			0		X										
	Answers clarifying questions directly.				0	X										
ESTABLISHES COMMUNICATION NETWORK	Identifies information consolidation points.			0		X	0									
	Informs subordinates of what information is to be transmitted (SALUTE)		0	0		X	0									
	Informs subordinates of non-verbal means of communication which could convey actions to be taken.		0	0		X										
COMMUNICATES CLEARLY AND INTELLIGIBLY	Underscores critical points for emphasis.					X										
	Prethinks communication.					X										
	Speaks distinctly and slowly.					X										
	Speaks with conviction.					X										
	Maintains steady eye contact (when appropriate).					X										
	Uses graphic aids.					X										
	Gestures to convey meaning.					X										
GATEKEEPING INFORMATION	Disseminates information at periodic intervals to subordinates and superiors.		0	0	0	X										
	Informs subordinates of changes in planned action.		0	0		X										
	After receiving communication, selects relevant information to transmit.					X										
	After selecting relevant information, selects appropriate method of communication.					X										

COMMUNICATION: Pursuit and Receipt of Information

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
ACTIVELY AND OBJECTIVELY LISTENS TO SUGGESTIONS FOR IMPROVEMENT OF OPERATION	Encourages suggestions non-verbally by standing with open posture, maintaining eye contact, nodding, avoiding frowning and grimacing.				0		X									
	Summarizes and paraphrases key points without a commitment to implement or not to implement suggestion.				0		X									
	Probes for more detail.				0		X	0								
DETERMINES SUFFICIENT INFORMATION?	Determines what information is needed.						X	0	0							
	Who possesses it.						X									
	How to collect it.						X									
	Asks superiors questions on any information that is unclear and needs clarification.						X									
RECEIVES AND IS ABLE TO RECALL OPERATION ORDER FROM SUPERIOR	The objective of the mission.						X									
	The enemy situation with respect to size of force, indirect fire capability, armor capability, current activity and anticipated actions.						X	0								
	Proposed execution of operation, including boundaries, starting point, location of objective and appropriate times.		0	0			X									
	What artillery support will be available.						X							0		
	Necessary call signs and radio frequencies.		0	0			X						0			
OBTAINS INTELLIGENCE OF ENEMY DISPOSITION BEFORE MAKING CONTACT	Sends out lead element.		0				X				0					
	Selects best personnel for task. (Skilled in map reading, moving quietly, acute vision.)						X									
	Means of communication is established (SITREP).		0	0		0	X						0			

COMMUNICATION: Pursuit and Receipt Of Information

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL Eqpt			TECHNICAL Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
RESPONDING TO CUES	Given some distinct due (e.g., explosion, small arms fire, etc.) attempts to identify specific nature of cue (by radio communication, runner, etc.)						X	0								
	After receiving incomplete verbal communication, obtains more complete information by verbally requesting information, sending fire team, using prearranged signals, etc.						X									
	If impossible to obtain more information, develops plausible hypotheses as to nature of situation and makes decisions accordingly.						X		0	0						

PROBLEM SOLVING: Identifying and Interpreting Cues

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
IDENTIFYING AND INTERPRETING CUES	Recognizes cues as indicator of enemy actions, intentions, or presence. (Note: especially important to recognize low visibility cues such as paper, feces, noise, land line, etc.).							X								
	Forms tentative hypotheses as to enemy's disposition (size, location, and intentions) given current and previous cues.							X								

PROBLEM SOLVING: Weighing Alternatives

X = Primary Relationships

0 = Secondary Relationships

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
WEIGHING ALTERNATIVES	Identifies alternative actions, given an interpretation of cues.	0							X							
	Determines probable consequesnces of each alternative action.								X							

PROBLEM SOLVING: Chooses and Executes Course of Action

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
CHOOSES AND EXECUTES COURSE OF ACTION	Selects alternative action that leads to most favorable (contributes most to mission accomplishment) consequence. (Aspects to be considered include time, casualties, ammunition, weapons required)									X						
	Executes course of action		0		0	0				X						
	Obtains information regarding consequences of chosen course of action						0	0		X						
	Repeats problem solving cycle as necessary									X						

TACTICAL: Application

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
MINIMIZE PROBABILITY OF BEING DETECTED	Instructing subordinates to maintain noise and light discipline.		0	0	0	0					X					
	Maintaining minimal radio traffic (radio discipline).		0	0	0	0					X		0			
	Moving during inclement weather.										X					
	Instructing subordinates to camouflage weapons, equipment, vehicles, positions, and themselves.										X					
	Instructing subordinate leaders to use routes of movement (and method of movement) to minimize exposure.		0								X					
	Instructing subordinates in methods for exercising caution when moving.		0	0							X					
ENHANCE PROBABILITY OF DETECTING ENEMY FORCE	Includes several OPs, LPs, patrols and ambushes as far forward as possible to provide adequate early warning and maximum number of engagement opportunities.						0				X					
	Includes a point element (or RECON when moving) as far forward as possible.						0				X					
	Disperse overwatch elements to maximize observation and engagement opportunities.						0				X					
	Booby traps, mines, probable avenues of approach not covered by personnel.						0				X					
DESTRUCTION OF ENEMY	Identify enemy's weakest point by employing probing action.						0	0			X					
	Engage attacking force as many times as possible before becoming decisively engaged.										X					
	Engages enemy at unexpected times and places (e.g., attacking enemy's rear).										X					
	Maintains reserves to meet unforeseen disposition of enemy.										X					

TECHNICAL-EQUIPMENT: Vehicles

X = Primary Relationship

O = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
VEHICLES	Operational check of vehicles prior to mission.											X				
	Instructs subordinate leaders on specific methods of movement (e.g., follows folds of terrain, overwatch, smoke).										O	X				
	Checks to ensure vehicles are properly camouflaged.											X				

TECHNICAL-EQUIPMENT: Communication Equipment

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL Eqpt			TECHNICAL Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
COMMUNICATION EQUIPMENT	Inspects communication equipment prior to inititating mission.												X			
	Uses all available means of communication.		0	0									X			
	Assigns communication equipment to most secure locations (e.g., center as opposed to periphery of mass).										0		X			
	Instructs subordinates on how to maintain proper communication security (e.g., Upholds/Enforces SOI).										0		X			
	Instructs subordinates on how to safeguard commo equipment (e.g., conceal land-mine).												X			
	Develops alternative communication plans and informs subordinates of those plans.												X			
	Obtains required frequencies (primary and alternate) and informs all personnel.												X			

TECHNICAL-EQUIPMENT: Weapons

X = Primary Relationsip

O = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	EQUIPMENT Eqpt			EQUIPMENT Basic	
		Planning	Execution & Control	Initiation Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
WEAPONS	Inspects weapons prior to initiation mission													X		
	Places weapons so that they take best advantage of maximum effective range										0			X		
	Positions weapons where they are most likely to engage appropriate targets (e.g., matches targets to weapons).							0			0			X		
	Positions weapons to have overlapping fields of fire										0			X		
	Positions weapons to compensate for limitations of other weapons (e.g., putting anti-tank mines on a probable avenue approach that can't be covered by deployed primary weapon)										0			X		
	Uses appropriate fuses and amounts (VT on troops in the open, DE on armored vehicles, PD on reinforced positions)													X		
	Uses pre-planned fires on anticipated enemy locations							0			0			X		
	Uses registration points to ensure security and to ensure artillery requests.												0	X		
	Request marking rounds prior to FFEs to ensure proper placement and maximum effective use of artillery													X		

TECHNICAL-BASIC: Terrain Analysis

X = Primary Relationship

O = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL Eqpt			TECHNICAL Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
TERRAIN ANALYSIS	Identifies probable enemy position depending on topography.							O							X	
	Accurately identifies possible enemy avenues of advance.							O							X	
	Uses terrain to conceal routes of advance.										O				X	

TECHNICAL-BASIC: Map Reading

X = Primary Relationship

0 = Secondary Relationship

		MANAGEMENT				COMMO		PROBLEM SOLVING			TACTICAL	TECHNICAL				
												Eqpt			Basic	
		Planning	Execution & Control	Initiating Structure	Interaction w/Sub & Superiors	Transfer of Information	Pursuit & Receipt of Info	ID & Interpretation of Cues	Weighing Alternatives	Choose & Execute Action	Application	Vehicles	Communication Equipment	Weapons	Terrain Analysis	Map Reading
MAP READING	Accurately follows planned avenues of advance.															X
	Contains all action (movement and fire) within specified AO.															X
	Accurately identifies coordinates of enemy positions.															X
	Occupies correct positions as identified on map.															X

APPENDIX C LEADER OBSERVATION CHECKLIST

LEADER OBSERVATION CHECKLIST

OBSERVER: ______________________ DATE: ____September

LEADER #: _____

Enter arbitrary leader number above. Ensure that Subordinate Questionnaires administered to this leader's subordinates have this number entered in the upper right hand corner of its coversheet. This will make it possible to match observation checklists to Subordinate Questionnaires. No names or unit designators are to be recorded anywhere.

The Leader Observation Checklist is broken into three sections. Section I lists behaviors and actions the leader should manifest while giving his OPORD to subordinates. Section II lists behaviors and actions the leader could manifest at any point during the exercise (including giving an OPORD). Section III lists behaviors and actions the leader should manifest during the actual exercise. Observations should be made accordingly.

The checklist contains a list of 96 behaviors and actions. For each behavior or action, observers should check one of three boxes:

☐ YES Check this box if, in most instances, the leader did what is listed in the checklist.

☐ NO Check this box if, in most instances, the leader did not do what is listed in the checklist.

☐ N/A Check this box if the leader did not have an opportunity to do what is listed in the checklist.

LEADER OBSERVATION CHECKLIST

SECTION I

THE FOLLOWING OBSERVATIONS SHOULD BE MADE WHILE THE LEADER IS GIVING HIS OPORD. DID THE LEADER:

	YES	NO	N/A
1. State the OBJECTIVE in terms of:			
A. What is supposed to be done.	☐	☐	☐
B. Where it is to be done.	☐	☐	☐
C. At what time it is to be done.	☐	☐	☐
2. State the ENEMY SITUATION in terms of:			
A. How many.	☐	☐	☐
B. Where.	☐	☐	☐
C. Anticipated action.	☐	☐	☐
D. Recent enemy activity.			
E. Equipment and weapons.	☐	☐	☐
3. State the FRIENDLY SITUATION in terms of:			
A. Support (artillery, TAC air, gunship).	☐	☐	☐
B. Disposition of friendly forces.	☐	☐	☐
4. State the CONCEPT OF OPERATION in terms of:			
A. LD/LC	☐	☐	☐
B. AO	☐	☐	☐
C. Check points and phase lines, if any.	☐	☐	☐

	YES	NO	N/A
5. State EXECUTION in terms of:			
A. What participating elements will be doing.	☐	☐	☐
B. How security of movement will be maintained.	☐	☐	☐
C. Specific requirements for these elements and priorities.	☐	☐	☐
D. Actions to be taken in event of enemy contact.	☐	☐	☐
E. Specific measures for controlling participating elements (phase lines, check points, rally points, attack positions).	☐	☐	☐
F. Adjustment of initial plan in event of heavy casualties.	☐	☐	☐
6. State COMMAND AND SIGNAL in terms of:			
A. Radio frequencies and call signs.	☐	☐	☐
B. Chain of command.	☐	☐	☐
C. Other signals.	☐	☐	☐
7. Ask subordinates to read back specific responsibilities.	☐	☐	☐
8. Graphically display overall operation using visual aids (ground, sticks, rocks).	☐	☐	☐
9. Ask subordinates to demonstrate, using visual aids, their specific tasks.	☐	☐	☐
10. Conduct rehearsal of planned execution by deploying forces in mock exercise.	☐	☐	☐

SECTION II

THE FOLLOWING OBSERVATIONS SHOULD BE MADE AT ANY TIME DURING THE REALTRAIN EXERCISE. DID THE LEADER:

		YES	NO	N/A
11.	Provide detailed instructions to subordinates regarding subordinates' responsibilities and those of other elements.	☐	☐	☐
12.	Explain tasks in terms of achievable steps.	☐	☐	☐
13.	Explain to subordinates exactly who will replace leaders who become casualties.	☐	☐	☐
14.	Inform subordinates of deadlines (e.g., LD times, times objectives are to be secured).	☐	☐	☐
15.	Describe well defined patterns of communication (e.g., SITREPs, "who talks to whom, when, about what, and how").	☐	☐	☐
16.	Clearly specify contingency plans including conditions under which contingency plans will be implemented (e.g., loss of communication).	☐	☐	☐
17.	Set definite standards of performance for specific tasks and responsibilities (e.g., specific dimensions of prone positions).	☐	☐	☐
18.	Explain his reasons for planned actions.	☐	☐	☐
19.	Pose specific questions by the leader to subordinates concerning their responsibilities and those of their peers (e.g., verbally responds to questions, uses maps, makes ground drawings, etc.).	☐	☐	☐
20.	Specifically describe to subordinates how they will be backed up in tight situations.	☐	☐	☐
21.	Tactfully and firmly provide corrective feedback to subordinates.	☐	☐	☐
22.	Firmly state unpopular decisions without apologizing (or blaming higher authority).	☐	☐	☐
23.	Defend/support actions of subordinates when criticized by others.	☐	☐	☐

		YES	NO	N/A
24.	Honestly admit mistakes to subordinates and superiors.	☐	☐	☐
25.	Tactfully disagree with superior's plans and provide possible alternatives.	☐	☐	☐
26.	Solicit reactions, opinions, suggestions of subordinates regarding mission.	☐	☐	☐
27.	Respond to non-verbal reactions (frowns, rolling of the eyes, head nods, etc.) of subordinates.	☐	☐	☐
28.	Provide public praise and recognition for work well done (decides appropriateness of public versus private praise).	☐	☐	☐
29.	Listen to suggestions from subordinates.	☐	☐	☐
30.	Assign responsibilities to subordinates.	☐	☐	☐
31.	Assign tasks according to subordinate strengths and weaknesses.	☐	☐	☐
32.	Calmly and firmly interrupt arguments, disagreements and other conflicts among subordinates.	☐	☐	☐
33.	Set positive examples for subordinates (e.g., noise discipline, staying awake, not smoking at night, camouflage, etc.)	☐	☐	☐
34.	Speak with enthusiastic, confident tone.	☐	☐	☐
35.	Praise group instead of individuals, if appropriate.	☐	☐	☐
36.	State importance of specific team elements in achieving group goals.	☐	☐	☐
37.	Provide specific positive praise for particular tasks well done.	☐	☐	☐
38.	Stay active by constantly interacting with subordinates (inquire about progress of individual tasks/assignments).	☐	☐	☐

	YES	NO	N/A
39. Ask subordinates to explain suggestions, ideas, objections that are unclear to him.	☐	☐	☐
40. Ask subordinate to "read-back" their specific responsibilities in operation.	☐	☐	☐
41. Correct any misunderstandings based on "read-back".	☐	☐	☐
42. Answer questions directly.	☐	☐	☐
43. Identify information consolidation points.	☐	☐	☐
44. Inform subordinates of what information is to be transmitted.	☐	☐	☐
45. Inform subordinates of non-verbal means of communication (hand signals, whistles, smoke, etc.) which could convey actions to be taken.	☐	☐	☐
46. Emphasize critical points.	☐	☐	☐
47. Speak distinctly and slowly.	☐	☐	☐
48. Maintain steady eye contact (when appropriate).			
49. Gesture to convey meaning.	☐	☐	☐
50. Encourage suggestions non-verbally by standing with open posture, maintaining eye contact, nodding, avoiding frowning and grimacing.	☐	☐	☐
51. Summarize and paraphrase key points without a commitment to implement or not to implement suggestion.	☐	☐	☐
52. Probe for more detail.	☐	☐	☐
53. Instruct subordinates to maintain noise and light discipline.	☐	☐	☐
54. Instruct subordinates to camouflage weapons, equipment, vehicles, positions, and themselves.	☐	☐	☐
55. Instruct subordinates to use routes of movement (and method of movement) to minimize exposure.	☐	☐	☐

	YES	NO	N/A
56. Instruct subordinates to perform operational check of vehicles prior to mission.	☐	☐	☐
57. Check to ensure vehicles are properly camouflaged.	☐	☐	☐
58. Inspect communication equipment prior to initiating mission.	☐	☐	☐
59. Use all available communication equipment.	☐	☐	☐
60. Assign communication equipment to most secure locations (e.g., center as opposed to periphery of mass).	☐	☐	☐
61. Instruct subordinates on how to maintain proper communication security (e.g., Upholds/Enforces SOI).	☐	☐	☐
62. Instruct subordinates on how to safeguard commo equipment (e.g., conceal land line).	☐	☐	☐
63. Develop alternative communication plans and inform subordinates of those plans.	☐	☐	☐
64. Inspect weapons prior to initiating mission.	☐	☐	☐
65. Place weapons so that they take best advantage of maximum effective range.	☐	☐	☐
66. Position weapons where they are most likely to engage appropriate targets (e.g., matches targets to weapons).	☐	☐	☐
67. Position weapons to have overlapping fields of fire.	☐	☐	☐
68. Use pre-planned fires on anticipated enemy locations.	☐	☐	☐
69. Use registration points to ensure security and to ensure artillery requests.	☐	☐	☐
70. Identify probable enemy positions depending on topography.	☐	☐	☐
71. Use terrain to conceal routes of advance.	☐	☐	☐

SECTION III

THE FOLLOWING OBSERVATIONS SHOULD BE MADE
DURING THE ACTUAL EXERCISE. DID THE LEADER:

		YES	NO	N/A
72.	Maintain continual communication with all elements.	☐	☐	☐
73.	Contact subordinates who are not adhering to designated reporting procedures.	☐	☐	☐
74.	Frequently ask for immediate and complete information from advance elements.	☐	☐	☐
75.	Give immediate direction and/or guidance in response to enemy activity (may first request additional information).	☐	☐	☐
76.	Quickly identify failures in execution of plan by participating elements and correct them.	☐	☐	☐
77.	Recognize critical points at which contingency plans should be implemented.	☐	☐	☐
78.	Make periodic checks on progress of group with respect to assigned tasks.	☐	☐	☐
79.	Enforce rules of conduct (e.g., informing subordinates of violations/consequences and taking appropriate disciplinary actions).	☐	☐	☐
80.	Allow subordinates to carry out delegated tasks (avoids encroaching on delegated responsibilities and avoid publicly criticizing subordinates).	☐	☐	☐
81.	Provide specific follow-up instructions in calm, assuring tone to subordinates who are in danger and obviously anxious.	☐	☐	☐
82.	Disseminate information at periodic intervals to subordinates and superiors.	☐	☐	☐
83.	Inform subordinates of changes in planned action.	☐	☐	☐

		YES	NO	N/A
84.	Given some distinct cue (e.g., explosion, small arms fire, etc.), attempt to identify specific nature of cue (by radio communication, runner, etc.).	☐	☐	☐
85.	After receiving incomplete verbal communication, obtain more complete information by verbally requesting information, sending fire team, using prearranged signals, etc.	☐	☐	☐
86.	Maintain minimal radio traffic (radio discipline).	☐	☐	☐
87.	Include a point element (or RECON when moving) as far forward as possible.	☐	☐	☐
88.	Disperse overwatch elements to maximize observation and engagement opportunities.	☐	☐	☐
89.	Identify enemy's weakest point by employing probing action.	☐	☐	☐
90.	Engage enemy at unexpected times and places (e.g., attacking enemy's rear).	☐	☐	☐
91.	Maintain reserves to meet unforeseen disposition of enemy.	☐	☐	☐
92.	Use appropriate fuses and amounts (VT on troops in open, DE on armored vehicles, PD on reinforced positions).	☐	☐	☐
93.	Request marking rounds prior to FFEs to ensure proper placement and maximum effective use of artillery.	☐	☐	☐
94.	Accurately follow planned avenues of approach.	☐	☐	☐
95.	Contain all action (movement and fire) within specified AO.	☐	☐	☐
96.	Accurately identify coordinates of enemy positions.	☐	☐	☐

APPENDIX D SUBORDINATE QUESTIONNAIRE

SUBORDINATE QUESTIONNAIRE

_____

IDENTIFICATION #: _____ DATE: __ September

The Army Research Institute is engaged in a series of studies on leadership. You have just completed a REALTRAIN exercise. We are interested in what your leader did and did not do during the exercise you have just finished. The information you provide is for research purposes only and will not hurt or help your leader's career in any way--so be honest. Your answers will never be sent to your superiors with any information which can be used to identify you or your unit. Your privacy is protected by professional ethics and Federal Regulations.

Instructions

You have been through several REALTRAIN exercises with your leader. We are only interested in the exercise you have just completed--not the ones you were involved in yesterday or last week. This questionnaire contains a list of things or actions your leader may have done during the exercise you have just finished. For each action there are three choices you can make:

☐ YES Check this box if your leader did do what is listed in the questionnaire.

☐ NO Check this box if your leader did not do what is listed in the questionnaire.

☐ N/A Check this box if your leader did not have a chance to do what is listed in the questionnaire. "N/A" means "not appropriate."

ONE AND ONLY ONE BOX IS TO BE CHECKED FOR EACH ACTION LISTED.

If you have any comments, suggestions, or recommendations about this questionnaire, feel free to tell the man who gave it to you or write your comments directly on the questionnaire. Your cooperation is appreciated.

WHEN YOUR LEADER GAVE YOU HIS OPORD (OPERATION ORDER), DID HE:

	YES	NO	N/A
1. State the OBJECTIVE in terms of:			
A. What is supposed to be done:	☐	☐	☐
B. Where it is to be done.	☐	☐	☐
C. At what time it is to be done.	☐	☐	☐
2. State the ENEMY SITUATION in terms of:			
A. How many.	☐	☐	☐
B. Where.	☐	☐	☐
C. Anticipated action.	☐	☐	☐
D. Recent enemy activity.	☐	☐	☐
E. Equipment and weapons.	☐	☐	☐
3. State the FRIENDLY SITUATION in terms of:			
A. Support (artillery, TAC air, gunship).	☐	☐	☐
b. Disposition of friendly forces.	☐	☐	☐
4. State the CONCEPT OF OPERATION in terms of:			
A. Where your LD/LC was.	☐	☐	☐
B. Where your AO was.	☐	☐	☐
C. Check points and phase lines, if any.	☐	☐	☐
5. State EXECUTION in terms of:			
A. What participating elements will be doing.	☐	☐	☐
B. How security of movement will be maintained.	☐	☐	☐
C. Specific requirements for these elements and priorities.	☐	☐	☐
D. Actions to be taken in event of enemy contact.	☐	☐	☐
E. Specific measures for controlling participating elements (phase lines, check points, rally points, attack positions).	☐	☐	☐
F. Adjustment of initial plan in event of heavy casualties.	☐	☐	☐

	YES	NO	N/A
6. State COMMAND AND SIGNAL in terms of:			
A. What your radio frequencies and call signs were.	☐	☐	☐
B. What your chain of command was.	☐	☐	☐
C. Other signals.	☐	☐	☐
7. Ask you to read back specific responsibilities.	☐	☐	☐
8. Graphically display overall operation using visual aids (ground, sticks, rocks).	☐	☐	☐
9. Ask you to demonstrate, using visual aids, your specific tasks.	☐	☐	☐
10. Conduct rehearsal of planned operation by deploying forces in mock exercise.	☐	☐	☐

(EVEN)

AT ANY TIME DURING THE EXERCISE, DID YOUR LEADER:

		YES	NO	N/A
1.	Explain tasks in terms of achievable steps.	☐	☐	☐
2.	Inform you of deadlines (e.g., LD times, times objectives are to be secured).	☐	☐	☐
3.	Clearly specify contingency plans including conditions under which contingency plans will be implemented (e.g., loss of communication).	☐	☐	☐
4.	Explain his reasons for planned actions.	☐	☐	☐
5.	Specifically describe to you how you will be backed up in tight situations.	☐	☐	☐
6.	Firmly state unpopular decisions without apologizing (or blaming higher authority).	☐	☐	☐
7.	Honestly admit mistakes to you and his superiors.	☐	☐	☐
8.	Solicit reactions, opinions, suggestions from you regarding mission.	☐	☐	☐
9.	Provide public praise and recognition for work well done (decides appropriateness of public versus private praise).	☐	☐	☐
10.	Assign responsibilities to you.	☐	☐	☐
11.	Calmly and firmly interrupt arguments, disagreements and other conflicts between yourself and others.	☐	☐	☐
12.	Speak with enthusiastic, confident tone.	☐	☐	☐
13.	State importance of specific team elements in achieving unit goals.	☐	☐	☐
14.	Stay active by constantly interacting with you and others (inquire about progress of individual tasks/assignments).	☐	☐	☐
15.	Ask you to "read back" your specific responsibilities in operation.	☐	☐	☐

	YES	NO	N/A
16. Answer questions directly.	☐	☐	☐
17. Inform you of what information is to be transmitted.	☐	☐	☐
18. Emphasize critical points.	☐	☐	☐
19. Maintain steady eye contact (when appropriate).	☐	☐	☐
20. Encourage suggestions non-verbally by standing with open posture, maintaining eye contact, nodding, avoiding frowning and grimacing.	☐	☐	☐
21. Probe for more detail.	☐	☐	☐
22. Instruct you to camouflage weapons, equipment, vehicles, positions, and yourself.	☐	☐	☐
23. Instruct you to perform operational check of vehicles prior to mission.	☐	☐	☐
24. Inspect communication equipment prior to initiating mission.	☐	☐	☐
25. Assign communication equipment to most secure locations (e.g., center as opposed to periphery of mass).	☐	☐	☐
26. Instruct you on how to safeguard commo equipment (e.g., conceal land line).	☐	☐	☐
27. Inspect weapons prior to initiating mission.	☐	☐	☐
28. Position weapons where they are most likely to engage appropriate targets (e.g., matches targets to weapons).	☐	☐	☐
29. Use pre-planned fires on anticipated enemy locations.	☐	☐	☐
30. Identify probable enemy positions depending on topography.	☐	☐	☐

(EVEN)

	YES	NO	N/A
31. Contact you when you did not adhere to designated reporting procedures.	☐	☐	☐
32. Give immediate direction and/or guidance in response to enemy activity (may first request additional information).	☐	☐	☐
33. Recognize critical points at which contingency plans should be implemented.	☐	☐	☐
34. Enforce rules of conduct (e.g., informing you of violations/consequences and taking appropriate disciplinary actions).	☐	☐	☐
35. Provide specific follow-up instructions in calm, assuring tone to you when you were in danger and obviously anxious.	☐	☐	☐
36. Inform you of changes in planned action.	☐	☐	☐
37. After receiving incomplete verbal communication, obtain more complete information by verbally requesting information, sending fire team, using prearranged signals, etc.	☐	☐	☐
38. Include a point element (or RECON when moving) as far forward as possible.	☐	☐	☐
39. Identify enemy's weakest point by employing probing action.	☐	☐	☐
40. Maintain reserves to meet unforeseen disposition of enemy.	☐	☐	☐
41. Request marking rounds prior to FFEs to ensure proper placement and maximum effective use of artillery.	☐	☐	☐
42. Contain all action (movement and fire) within specified AO.	☐	☐	☐

(EVEN)

SUBORDINATE QUESTIONNAIRE

IDENTIFICATION #: _____ DATE: ___ September

The Army Research Institute is engaged in a series of studies on leadership. You have just completed a REALTRAIN exercise. We are interested in what your leader did and did not do during the exercise you have just finished. The information you provide is for research purposes only and will not hurt or help your leader's career in any way - so be honest. Your answers will never be sent to your superiors with any information which can be used to identify you or your unit. Your privacy is protected by professional ethics and Federal Regulations.

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☐	YES	Check this box if your leader did do what is listed in the questionnaire.
☐	NO	Check this box if your leader did not do what is listed in the questionnaire.
☐	N/A	Check this box if your leader did not have a chance to do what is listed in the questionnaire. "N/A" means "not appropriate".

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If you have any comments, suggestions, or recommendations about this questionnaire, feel free to tell the man who gave it to you or write your comments directly on the questionnaire. Your cooperation is appreciated.

WHEN YOUR LEADER GAVE YOU HIS OPORD (OPERATION ORDER), DID HE:

	YES	NO	N/A
1. State the OBJECTIVE in terms of:			
A. What is supposed to be done.	☐	☐	☐
B. Where it is to be done.	☐	☐	☐
C. At what time it is to be done.	☐	☐	☐
2. State the ENEMY SITUATION in terms of:			
A. How many.	☐	☐	☐
B. Where.	☐	☐	☐
C. Anticipated action.	☐	☐	☐
D. Recent enemy activity.	☐	☐	☐
E. Equipment and weapons.	☐	☐	☐
3. State the FRIENDLY SITUATION in terms of:			
A. Support (artillery, TAC air, gunship).	☐	☐	☐
B. Disposition of friendly forces.	☐	☐	☐
4. State the CONCEPT OF OPERATION in terms of:			
A. Where your LD/LC was.	☐	☐	☐
B. Where your AO was.	☐	☐	☐
C. Check points and phase lines, if any.	☐	☐	☐

(ODD)

		YES	NO	N/A
5.	State EXECUTION in terms of:			
	A. What participating elements will be doing.	☐	☐	☐
	B. How security of movement will be maintained.	☐	☐	☐
	C. Specific requirements for these elements and priorities.	☐	☐	☐
	D. Actions to be taken in event of enemy contact.	☐	☐	☐
	E. Specific measures for controlling participating elements (phase lines, check points, rally points, attack positions).	☐	☐	☐
	F. Adjustment of initial plan in event of heavy casualties.	☐	☐	☐
6.	State COMMAND AND SIGNAL in terms of:			
	A. What your radio frequencies & call signs were.	☐	☐	☐
	B. What your chain of command was.	☐	☐	☐
	C. Other signals.	☐	☐	☐
7.	Ask you to read back specific responsibilities.	☐	☐	☐
8.	Graphically display overall operation using visual aids (ground, sticks, rocks).	☐	☐	☐
9.	Ask you to demonstrate, using visual aids, your specific tasks.	☐	☐	☐
10.	Conduct rehearsal of planned operation by deploying forces in mock exercise.	☐	☐	☐

AT ANY TIME DURING THE EXERCISE, DID YOUR LEADER:

		YES	NO	N/A
1.	Provide detailed instructions to you regarding your responsibilities and those of other elements.	☐	☐	☐
2.	Explain to you exactly who will replace leaders who become casualties.	☐	☐	☐
3.	Describe well defined patterns of communication (e.g., SITREPs, "who talks to whom, when, about what, and how").	☐	☐	☐
4.	Set definite standards of performance for specific tasks and responsibilities (e.g., specific dimensions of prone positions).	☐	☐	☐
5.	Pose specific questions to you concerning your responsibilities and those of your buddies to make sure you understood what to do.	☐	☐	☐
6.	Tactfully and firmly provide corrective feedback to you.	☐	☐	☐
7.	Defend/support your actions when criticized by others.	☐	☐	☐
8.	Tactfully disagree with superior's plans and provide possible alternatives.	☐	☐	☐
9.	Respond to non-verbal reactions (frowns, rolling of the eyes, head nods, etc.) of you and your buddies.	☐	☐	☐
10.	Listen to suggestions from you.	☐	☐	☐
11.	Assign tasks according to your and your buddies strengths and weaknesses.	☐	☐	☐
12.	Set positive examples for you (e.g., noise discipline, staying awake, not smoking at night, camouflage, etc.).	☐	☐	☐
13.	Praise group instead of individuals, if appropriate.	☐	☐	☐

	YES	NO	N/A
14. Provide specific positive praise for particular tasks well done.	☐	☐	☐
15. Ask you to explain any of your suggestions, ideas, or objections that were unclear to him.	☐	☐	☐
16. Correct any misunderstandings you may have had about what he said.	☐	☐	☐
17. Identify who information is to be passed to when something happens.	☐	☐	☐
18. Inform you of non-verbal means of communication (hand signals, whistles, smoke, etc.).	☐	☐	☐
19. Speak distinctly and slowly.	☐	☐	☐
20. Gesture to convey meaning.	☐	☐	☐
21. Summarize and paraphrase key points without a commitment to implement or not to implement suggestion.	☐	☐	☐
22. Instruct you to maintain noise and/or light discipline.	☐	☐	☐
23. Instruct you to use routes of movement (and method of movement) to minimize exposure.	☐	☐	☐
24. Check to ensure vehicles are properly camouflaged.	☐	☐	☐
25. Use all available communication equipment.	☐	☐	☐
26. Instruct you on how to maintain proper communication security (e.g., Upholds/Enforces SOI).	☐	☐	☐
27. Develop alternative communication plans and inform you of those plans.	☐	☐	☐
28. Place weapons so that they take best advantage of maximum effective range.	☐	☐	☐
29. Position weapons to have overlapping fields of fire.	☐	☐	☐

	YES	NO	N/A
30. Use registration points to ensure security and to ease artillery requests.	☐	☐	☐
31. Use terrain to conceal routes of advance.	☐	☐	☐
32. Maintain continual communication with all elements.	☐	☐	☐
33. Frequently ask for immediate and complete information from advance elements.	☐	☐	☐
34. Quickly identify failures in execution of plan by participating elements and correct them.	☐	☐	☐
35. Make periodic checks on progress of group with respect to assigned tasks.	☐	☐	☐
36. Allow you to carry out delegated tasks (avoids encroaching on delegated responsibilities and avoids publicly criticizing you).	☐	☐	☐
37. Disseminate information at periodic intervals to you and others.	☐	☐	☐
38. Given some distinct cue (e.g., explosion, small arms fire, etc.), attempt to identify specific nature of cue (by radio communication, runner, etc.).	☐	☐	☐
39. Maintain minimal radio traffic (radio discipline).	☐	☐	☐
40. Disperse overwatch elements to maximize observation and engagement opportunities.	☐	☐	☐
41. Engage enemy at unexpected times and places (e.g., attacking enemy's rear).	☐	☐	☐
42. Use appropriate fuses and amounts (VT on troops in open, DE on armored vehicles, PD on reinforced positions).	☐	☐	☐
43. Accurately follow planned avenues of approach.	☐	☐	☐
44. Accurately identify coordinates of enemy positions.	☐	☐	☐

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